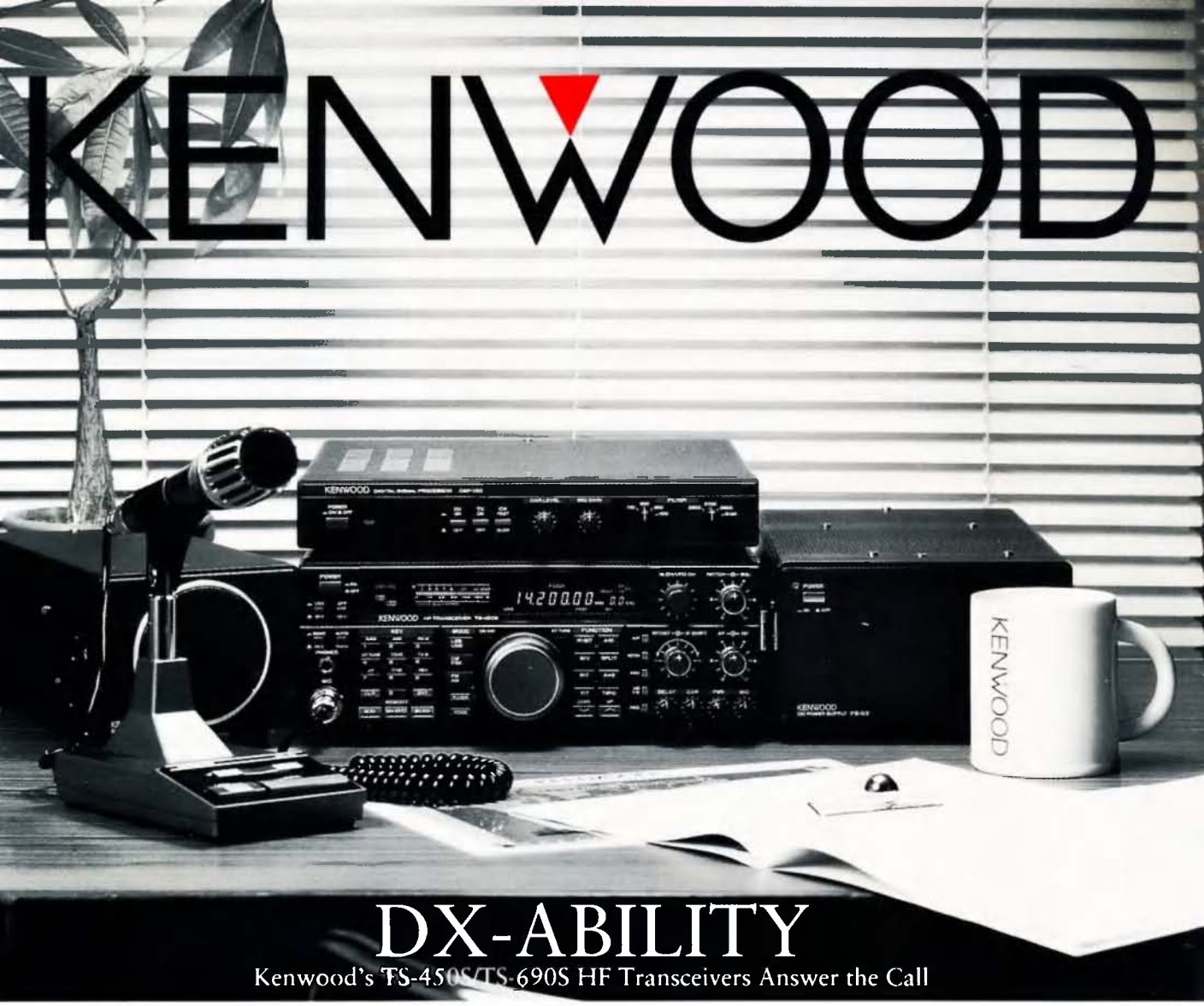
AMATEUR RADIO

JANUARY 1993 RRP $3.25

- 10 GHz record broken . . .
- Product Review — Baycom Packet Modem
- Amateur Radio and EMC (Part 1)

THE WIA RADIO AMATEUR'S JOURNAL

KENWOOD



DX-ABILITY

Kenwood's TS-450S/TS-690S HF Transceivers Answer the Call

Wherever you are, whatever the situation, you can always count on Kenwood's TS-450S and TS-690S for tough, dependable performance. Products of world-famous Kenwood engineering, these versatile HF transceivers are designed for SSB, CW, AM, FM and FSK modes of operation on all Amateur bands, including the WARC bands. To further enhance capabilities, choose the optional DSP-100 Digital Signal Processor. The AT-450 Automatic Antenna Tuner is built into the TS-450S, and is available as an internal option for the TS-690S. Along with multi-function operation and the highest levels of quality and performance, both models offer yet another advantage: ultra-compact dimensions ideal for DXpeditions and mobile use.

Enjoy all the advantages of these superior features:

■ Superior receiver dynamic range of 108dB ■ Kenwood's exclusive AIP (Advanced Intercept Point) system ■ General coverage receiver ■ Automatic antenna tuner (TS-450S only) ■ Inbuilt automatic ATU option (TS-690S only) ■ Ultra-compact design ■ Excellent split frequency operation ■ CW pitch and CW reverse mode selection ■ Digital bar meter and multi-function LCD display ■ IF shift circuit ■ Dual-mode noise blanker (pulse or 'woodpecker') ■ 1Hz fine tuning ■ 100 memory channels ■ 100 watts output on all HF bands ■ 50 watts output on 50 to 54 MHz six metre band (TS-690S only)

HF TRANSCEIVER **TS-450S/TS-690S** HF TRANSCEIVER

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(INCORPORATED IN N.S.W.)

8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140
Phone (02) 746 1519, (02) 746 1888, Fax (02) 746 1509
Call now for further information and the name of your nearest authorised Kenwood dealer.

Kenwood Electronics Australia Pty Ltd only warrants products purchased from their authorised Australian dealers

Please phone, mail or fax for information
Name.....
Address.....
..... Postcode.....
Publication..... Issue .....
Model.....

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 1 ISSN 0002-6859 January 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Margaret Allen
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
February	11/1/93	13/1/93
March	8/2/93	10/2/93
April	8/3/93	10/3/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

Mai VK3BBU and Max VK3WOD at Mt Worth (Vic) ready to establish a new 10 GHz Video record. Refer to the article on Page 8.

The cover photograph and photographs accompanying this article were kindly supplied by Peter Ford VK3TAF. Colour processing is with the compliments of BOND COLOUR LABORATORIES, Richmond Vic.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service — Member of the International Amateur Radio Union
Registered Federal office of the WIA: 3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Ron Henderson	VK1RH
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3ZJC
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
WARC & CCIR	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Editor's Comment

Bill Rice VK3ABP
Editor

Exam Reports

You will be excused if you immediately imagine that I am going to talk about the WIA Exam Service. No, I am NOT! That can be safely left to the team in the Federal Office. Instead, I want to mention an examination recently conducted by half a dozen members of the Redcliffe Radio Club (VK4), in which the candidate was this magazine (or more specifically the October 1992 issue). The Redcliffers then sent us a report entitled "The Worth of 'Amateur Radio' ".

I am happy to be able to say that we passed their exam! Perhaps not with "flying colours", perhaps "damned with faint praise", but still with the score above the acceptable minimum. I think it may interest many of you if I quote some of the examiners' remarks.

First, a solid body-blow; "recently given 24 mint issues of AR by a clubmate. By mint I mean unopened — still in their plastic wrappers"! Having survived that depressing assessment, we were then "looked at ... with a fairly critical eye". My editorial comments "are becoming treatises of a bygone era ... a perception of old-world attitudes". Thank you, Redcliffers! I don't know whether to feel flattered or insulted! They go on to say that I "should canvass important/controversial areas of the WIA and the Amateur Service". I thought I was hitting fairly hard in October, talking about "anti-social and un-civilised" behaviour, but it seems I have a clearance from Redcliffe to hit even harder!

The writer of the report is Editor of the club's quarterly magazine and "would not wish to produce 12 x 400 word plus editorials each year". I do sincerely appreciate his sympathy.

WIANEWS came next, with each of 20 news items being critically examined. A mixed bag, but generally favourable. The comments and statistics about exams were "self-serving drumbeating", but almost everything else was marked "good". Much the same applied to the technical articles, even though the examiners were initially "prepared to 'tip a bucket' ".

Some of the columns were thought to be a bit long, but here the examining panel became rather subjective, different people having different preferences. This was no surprise to us, trying each month to produce a more balanced magazine!

The final paragraph was a gem! "We approached this originally with the idea of proving "Amateur Radio" a waste of fine trees, but instead came away knowing that it's not a bad read and deserves its spot on the bookshelf". Thank you Redcliffe, for an assessment. You didn't say, "could try harder", but we are going to anyway!

To an examination of another kind. Last month I "re-cycled" some of my 1984 editorial comments, and thought I might continue with that process. First, of course, all that "old stuff" must be read again. But look at all that other material we published in 1984. And 1985,

the WIA 75th Anniversary Year. Masses of information, history, even news. "Bygone ages" can be very interesting!

Back in those days, barely eight years ago, we were publishing 72 page issues, with 20 pages of advertising. In the last issue (December 1992) we had nine pages of advertising, and that was the best for many months! We had a 60 page issue rather than 56, because of the colour centre spread for Dick Smith Electronics. Since 1984, by stringent economies, more of the work "in-house", and the increasing productivity of modern technology, we have been able to hold our costs down far better than seemed possible.

Unfortunately, the same economic landslide, since 1987, which has cut advertising from 20 pages to five or six has also cut membership to just under 6000, from a peak of over 8000. May we hope that perhaps 1992 was the negative peak of the economic cycle and that 1993 may in fact be a Happy New Year! **ar**

Amateur Radio Awards

At the Publications Committee meeting held on 1st December 1992, the annual Amateur Radio awards were allocated.

Al **Shawsmith Award for Journalistic excellence** — Barrie Gillings, VK2DWC — for the article "A Mother of a Storm". Barrie's graphical and humorous description of what must have been a terrifying period, during which his house seemed about to collapse around him.

Technical Award — Drew Diamond VK3XU — for a number of high quality technical articles. Drew consistently provided a first class presentation of his material, including high grade drafting of the diagrams. His articles required little or no editing.

Higginbotham Award — Jointly to Ron Fisher VK3OM and Bill Roper VK3ARZ — for voluntary service to the WIA over 17 years of production of the Federal Tapes.

The committee recognised that one of the joint recipients, Bill Roper VK3ARZ is currently a paid employee of the WIA. However, notwithstanding this, Bill for many years prior to, and during the last four years of his engagement, as an UNPAID VOLUNTEER readily performed the duties as stated above. In this respect the committee was satisified that there was no conflict of interest, and had great pleasure in confirming the award.

The Publications Committee congratulates all recipients. **ar**

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Divsion, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Terry Ryeland Bob Lloyd Jones Bob Taylor Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 865 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Ken Ayers David Travis	VK4QA VK4KD VK4ATR
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allen Roland Bruce Bill Wardrop	VK5BJA VK5OU VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland-Thomas	VK6LZ VK6AFA VK6OO
VK7	Tasmanian Division 148 Derwent Avenue Lindisfame TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			

Note: All times are local. All frequencies MHz.

Weekly News Broadcasts	1993 Fees	
3.570 MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70 cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.120, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times.

WIA News

From the WIA Federal Office

New Licence Conditions

The SEANET Convention in Darwin was the scene for the announcement of forthcoming changes to the amateur radio licence conditions, given in a speech on Saturday night 31 October by the Hon. Warren Snowden MP, standing in for the Minister for Transport and Communications, Senator Bob Collins.

The speech was taped and broadcast nation-wide on each Divisional broadcast on Sunday morning, 1 November, through a telephone hookup to all Divisions from Darwin arranged by Darwin ARC President, Bill "Spud" Murphy VK8ZWM and sponsored by Telecom Australia. The event was unprecedented in WIA history.

Most WIA members will have heard the broadcast speech, which indicated that the proposed changes to the licence conditions would come into effect "early in 1993" and that the specifics of the proposal would be published in AR magazine "very soon".

However, while it was expected that documentation would be forthcoming from the Department of Transport and Communications (DoTC) in mid-November, in time for publication in the December issue, there has been a delay in drafting sections of the revised licence conditions.

As soon as the completed new licence conditions are received from DoTC, a detailed summary will be provided on WIA Divisional news broadcasts and the full details published in Amateur Radio magazine.

Meanwhile, to reiterate, the main points outlined in the announcement of 31 October were:

- Introduction of a no-code Novice **Limited** class of licence allowing use of voice and packet radio transmissions in the 144 MHz and 432 MHz bands;
- Allowing Limited Licensees use of FM telephony on the 29 MHz band, encouraging more use of 10m.
- Holders of the Combined Novice and Limited class of licence would be recognised under a single category to be known as the Intermediate class licence.
- Novice stations to be permitted a limited increase in power, consistent with the state of technology and the availability of equipment.
- Usage of packet radio technology will see unnecessary technical rules removed.
- Rules applying to the use of repeater stations will be simplified.

In his address, Warren Snowden said many of the previous rules were unnecessarily restrictive and impeded the use of new technology.

He went on to add, "I would like to congratulate the Wireless Institute of Australia for its valuable contribution on behalf of its members to the development of reforms to further deregulate the service for the benefit of the amateur operators throughout Australia."

Topping off the good news of the main announcement, Warren Snowden advised that amateur licence fees would remain at $35 for 1993.

More Good Publicity for Amateur Radio

Amateur Radio gained valuable public exposure at the Australian Broadcasting Commission's 60th Birthday celebration Picnic in the Park held in Sydney's Parramatta Park early in November.

NSW Division Councillors and volunteers organised and manned a display van with an exhibition along a theme of "past and present", showing the link between the gestation of broadcasting and early amateur radio, and the development of amateur radio into a modern technological hobby.

Some choice items from the Division's historic radio collection, organised by Aub Topp VK2AXT were on display, while some up-to-date Kenwood transceivers borrowed from the Division's VK2BWI station at Amateur Radio House Parramatta were activated for live demonstrations. Just to cap the historic theme, the special callsign VI150SYD was used.

The display was well-positioned to be seen by the tens of thousands of ABC listeners and viewers who turned up at the event. A large number of publicity pamphlets were given away and those manning the stand went hoarse answering questions.

NSW Divisional President, Terry Ryeland VK2UX, was interviewed on-air on station 2BL in the middle of the day by ABC radio personality Bob Hughes — who also happens to hold the callsign VK2YOW (yes, he's a member!).

As a result of follow-up publicity, the local newspaper group, Cumberland Newspapers, came around to the Division and interviewed Terry VK2UX and Aub VK2AXT. This which appeared along with a photograph of the interviewees in late November.

EMC Standards

The Standards authorities of Australia and New Zealand are moving towards the introduction of regional standards covering a range of electronic and electrical appliances and equipment which can either cause, or suffer from, RF interference.

Standards Australia issued new joint Australian and New Zealand standards in October. A complete set of these has been purchased by the Federal Office and held in the library there.

RF *immunity levels* for TV and broadcast receivers is covered by one of these new standards, while others cover the *unwanted RF* energy (RFI) generated by VCRs, TV and sound broadcast receivers, computers and other information technology equipment, vehicle ignition systems and power tools.

The issuing of these new standards is an important preliminary to revisions currently under way to the Radiocommunications Act 1983. When originally drafted, provision for such electromagnetic compatibility (EMC) standards was included in the Act, but Australian governments to date have been reluctant to make mandatory standards, perhaps under pressure from manufacturers and importers.

It now seems such EMC standards will become a

technological imperative for consumer goods in Australia, long after wide adoption in Europe.

Call Book on Disk?

The 1993 Call Book can not be made available on computer disk, or any other form of electronic data.

The Federal Office receives a number of requests each year to supply the Call Book in such form. It seems like a great idea in this "information age", but the contract between the Australian Government Publishing Service and the WIA prohibits the WIA from doing it.

The WIA only has the right, by way of licence, to publish the Call Book in its printed book format. This, and the copyright provisions, excludes other means of publishing the information, including in electronic form, such as supplying the information as a text file on computer disk.

ZL 160m "Have A Go" Activity

This popular activity for 160m enthusiasts and experimenters will be on again this March, hosted by the Hastings Branch 13 of the NZART.

It's not a contest, just an activity to encourage experimentation on the band as well as some recreation.

But to provide flexibility and to encourage and enable the use of enhanced antennas, the organisers have scheduled the activity to coincide with the NZART Field Day — but it does not form any part of the Field Day contest. It does provide a chance, the organisers say, to guarantee a result for your experimental effort.

The 160m Have A Go Activity runs in two time blocks, from 2000 hrs NZT on Friday 5/3/93 to 0300 hrs NZT Saturday 6/3/93, then from 2000 hrs on 6/3/93 to 0300 hrs on Sunday 7/3/93.

Prime frequency is 1840 kHz, but you are encouraged to use anywhere in the band, as has happened in past Activities. Mode is LSB or CW.

Contact for more information is David Walker ZL3DK, 36 Ardrossan Ave, Flaxmere, Hastings NZ.

Want to Contact the Federal Office on Packet?

You can't. While, as a packet operator, you have probably noticed the monthly Federal WIANEWS items disseminated through the packet bulletin boards network by VK3WIA, if you have tried to send a message back to VK3WIA, you're probably wondering why you've never received a response.

That's because, simply, the regulations prohibit it. The relevant section says that a station shall not be used: *"to transmit material relating to industrial, commercial, political, social or religious matters"*. Unfortunately, almost all correspondence with the WIA Federal Office falls into the commercial category. This particularly includes subscription matters, changes of address or callsign, missing AR magazines, etc.

So as not to breach the regulations, VK3WIA is used only for sending out news items relating to the Amateur Radio Service. VK3WIA does not accept incoming packet traffic.

So, if you want to contact the Federal WIA, stick to the common means: phone, fax or Australia Post. Contact details are given on page one of each issue of Amateur Radio magazine, and page one of the 1993 Call Book. Divisional contact details are given on page three of each AR and on page two of the 1993 Call Book.

Progress at VNG

Standard frequency and time signal service station, VNG, located at Llandillo west of Sydney, has secured recurrent funding to keep it on the air, and now transmits on a new frequency — 2.5 MHz — according to a release from VNG Users Consortium Secretary, Dr Marion Leiba VK1VNG/VK1BNG.

The new 2.5 MHz signal is a 1 kW transmission from a second-hand Harris-Gates transmitter, radiated from a vertical antenna. The first on-air tests took place on 9 September 1992 and "quasi-continuous" transmission started as a test on 7 October.

"This additional frequency is now permanent, barring unforeseen problems," said Dr Leiba.

The 2.5 MHz signal is intended primarily for the Sydney area where users were having difficulty receiving the VNG transmissions on 5.0, 8.638, 12.984 and 16 MHz which are radiated from horizontal antennas.

The National Standards Commission succeeded in obtaining recurrent funding for VNG as part of a New Policy Proposal. VNG has been funded to date by donations from users (who formed the voluntary VNG Users Consortium) and funding from The Australian Surveying and Land Information Group (AUSLIG), who provided running costs for the past four years and funded the reassembly of the station at Llandillo.

A standby transmitter has been obtained ex-Radio Australia. It is an STC, the same as the other four at VNG. A second "talking clock" is being constructed, as backup to the unit that went to air from January 1992.

Basic Radio Manual

The NZART has published a new, revised edition of its *Basic Radio Training Manual*. While it is aimed to cover requirements of the New Zealand amateur licensing system, the publication may be of interest and use to people studying for their licence in Australia as it covers fundamental radio theory.

A copy is in the hands of Brenda Edmonds VK3KT, who is to review it for an early issue of Amateur Radio magazine.

For people outside New Zealand who wish to obtain a copy, it costs A$13.00 post-paid for single copies. NZART advise that discounts are available if ordering ten or more copies. Write to NZART, PO Box 40 525, Upper Hutt, NZ.

Station Statistics

As at 30 September, there were 18,701 station licences held by Australian radio amateurs. The "most populous" state is NSW, with 5461 licences held, followed by Victoria, with 5002.

The number of repeater licences is 320, 85 of which are in NSW, and 84 in Victoria, while Queensland follows close behind with 70. There are 28 beacon licences.

Hams and Hurricanes, Again

Less than a month after Hurricane Andrew devastated Florida in the United States (see WIANEWS, December 1992 issue), Hurricane Iniki swept across the Hawaiian island of Kauai and the western coastline of Oahu on 11 September 1992.

The ARRL newsletter of

November 12 carried an extensive report on the involvement of amateur radio during and after the emergency.

The Radio Amateur Civil Emergency Service (RACES) was activated when Iniki approached the vicinity of Hawaii, which provided vital communications links on VHF FM and packet. Other individuals provided communications too, via VHF FM voice, VHF packet and HF packet. At times, amateur radio provided the only communications links, according to the report.

A great deal of health and welfare traffic was passed via amateur radio during the restoration efforts once the hurricane had passed. Two operators originated more than 1000 messages in six non-stop hours, completing calls to as far away as Sweden, the ARRL newsletter reported. Over 30 individual amateurs were involved.

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of November 1992

L20850	MR B EDGE
L20851	MR R S FOOTE
L20872	MR S HIGHLEY
L30815	MR M MASTROCINQUE
L30827	MR G DUIGAN
L40323	MR R N THORNTON
L40324	MR N DUMMA
L60319	MR R W BARR
VK2AP	MR J R THURSTUN
VK2IRJ	MR I R JONES
VK2NRX	MR R BUNN
VK3DEB	MR B THEODORE
VK3EVN	MR E V N SHAW
VK3JAH	MR D BARROW
VK3PQ	MR M BURRELL
VK3YDR	MR N DARRAGH
VK4DBI	MR T K MILLION
VK4FGR	MR G D ROWE
VK4MCA	MR J MCASPURN
VK4NPH	MR P B HARDING
VK4TDS	MR D J HOLZNAGEL
VK4VDZ	MR S P BONNELL
VK4WTN	MR W T NEWPORT
VK5YLE	MR L MCDONALD
VK6ADF	MR P R HECKINGBOTTOM
VK6AUD	MR P J BOTTRELL
VK6BHI	MR C J LORD
VK6XY	MR A M KEIGHTLEY
VK6ZCW	MR C W BROOKE
VK6ZJD	MR B J DOLPHIN
VK7PAO	MR T C BRUNDLE

ar

ANNINDEX

Annual Index 1992

Due to the earlier closing deadlines for this issue (brought about by the Christmas and New Year holiday season), the Annual Index of articles published in AR during 1992 has regretfully been held over until the February 1993 issue ... VK3UV Production Editor.

Point report from the October Board meeting

CONTINUING THE President's undertaking to provide a point summary of each WIA Board meeting, the report on the meeting held over the weekend 24/25 October 1992 follows. Further details may be obtained from your Divisional Federal Councillor.

The October meeting of the WIA Board:

- Accepted the resignation of Terry Ryeland as a Director and appointed Roger Harrison, the VK2 Federal Councillor as a Director in his place.
- Received a report from the President on his visits to Divisions and radio clubs as reported in WIANEWS.
- Received a report from the General Manager on Federal Office matters. The office LAN server has been upgraded. Difficulties with customs duty certifications for a particular transceiver have been resolved. The General Manager has been able to take some recreation leave.
- Received a report on publications that delivery of *Amateur Radio* magazine to many members, commencing from the December issue, may be through a delivery agency other than Australia Post.
- Received a report on examinations which showed the average pass rate remains 51%. The income from examinations, after allowing for foregone income on members' funds, now shows the break-even point will now be in around two and a half years time. The General Manager is being subjected to unwarranted personal abuse on packet networks and through the mail as a result of the examination fees increase. The Board agreed DoTC be approached to increase surveillance and audit of examinations as a matter of urgency.
- Heard from David Wardlaw about his paper to Communication 92 in Sydney and his recent attendance at an IARU Administrative Council meeting as the Region III representative. David also spoke on his continuing involvement in WARC related matters.
- Reviewed the draft WIA 1993 Program Objectives and after some amendments adopted them. The Objectives will be published in *Amateur Radio* in due course for member's information.
- Directed the Secretary/Manager to enter into negotiations to create a national heading in the "yellow pages" of "Clubs -Amateur Radio".
- Appointed Bob Godfrey VK4BOB as Federal Video Tape Co-ordinator to replace John Ingham.
- Agreed there was not unanimous support for a Federal 008 number; and that 0055 numbers were seen as a Divisional responsibility.
- Reviewed Divisional Bookshop activities, aired problems and further agreed the matter of club listings was a Divisional one.
- Observed there was a perceived need for a novice correspondence course and a supplier of good resource material.
- Adopted the 1993 Planning Budget Worksheets, as amended, as a planning basis for 1993. These are based on no increase in the Federal component of subscriptions for 1993. In so doing the Board noted the surplus was only 2.7% of gross income.
- Examined a paper from Peter Maclellan on trading policy considerations and agreed "trading" was not to be excluded from the revision of the Articles
- Adopted in principle both half yearly and three yearly subscription options. The General Manager advised, because not all Divisions wished to introduce the half yearly option, it was impractical to proceed with this initiative.
- The revision of beacon policy was referred to FTAC, with a report requested to the Board's subcommittee, Roger Harrison, for the next meeting.
- The Board resolved to ask DOTC for permission to use special callsign prefixes during international contests chosen by the Federal Contest manager.
- Examined recommendations from WICEN concerned with callsigns and frequencies, and agreed to request an options paper from WICEN. Peter Maclellan would then develop options for the General Manager to use when negotiating with DoTC.
- Reviewed a batch of revised Policy Statements and adopted those concerned with Gentlemans Agreements, EMC, Novice Licensing, Third Party Traffic, QSL Bureaux, Narrow Band Modes, Operation of BBS, Intruder Watch, Education and Concessional Membership. The Regulations concerned with affiliated organisations were also adopted.
- Received a paper from Roger Harrison on Amateur Radio magazine policy issues, for further Board consideration.
- Agreed the Public Relations Policy Statement required further revision.
- Resolved to prepare a Standing Order on the release from Board confidentiality by Board members of material before the Board for consideration.
- After a thorough review, resolved that with regard to news releases from the Federal WIA:
  Federal tapes as currently prepared will be discontinued, this does not reflect upon the integrity and dedicated service of the tape coordinators over the past 17 years;
  The preparation of WIANEWS will continue and authorised news

releases will be made available to Divisions, in addition to the current recipients, by the Secretary.
A release from the Board about these matters will be prepared by the chairman.
That release became the substance of the final Federal tape broadcast over the SEANET 92 weekend.

- Roger Harrison was appointed the Federal Media Officer.
- Noted the Federal Media Officer would process the WIA policy on responding to inaccurate public statements.
- Noted the General Manager's contract calls for an indication of acceptance of options for a second and final five year term by 10 November 1992, and noted his duties will be varied as a result of restructuring; resolved to seek the General Manager's agreement to extend his decision point by 12 months.
- Appointed a sub-committee of the President, Vice-president and Peter Maclellan to progress the General Manager's duty statement revision and contract renewal.
- The Board met formally for almost 15 hours and considered over 30 agenda items. A further 6 lower priority items were carried over to February. In addition to the formal meeting Federal Councillors met informally for 2 1/2 hours. The Board will meet again on 20-21 February 1993 in Melbourne.

ar

Just for the record.... (New 10 GHz record)

Peter J Ford VK3TAF

"BECAUSE IT IS there.". a quotation from Sir Edmund Hillary when asked why he climbed Mount Everest in 1953. Such is the spirit encompassed by a small group of amateurs in Melbourne in their pursuit of something different. For some time, this group has been experimenting, testing and rebuilding in an effort to enhance their knowledge of little known parts of the spectrum available. Contacts with others using electromagnetic waves of various frequencies is a common goal, with the ability to establish this over ever increasing distances adding an extra challenge.

Recent articles indicated that the 10 Gigahertz band offered considerable room for experimental activity with virtually no commercial amateur equipment being readily available. Any equipment used would either have to be built from scratch or perhaps some other commercial equipment may be modified or "cannibalised" for amateur use. Propagation characteristics were scarcely that of the DX bands or even the traditional VHF bands. Just what are the significant features of propagation in this unknown territory?

Initial efforts to generate energy in this band were confined to simple oscillators using surplus microwave intruder alarms. These devices utilise a Gunn diode in a cavity and oscillate in this configuration at about 10.5 GHz, just above the allocated amateur band. Fortunately, these units have a small tuning screw which allows some frequency adjustment to within the band. At least a relatively simple way of generating RF energy was available at low cost. Within an intruder alarm, there is a diode detector suitable for use at the microwave frequencies. This could be used to detect energy radiated from another intruder alarm. If the frequencies used by two units were separated by a small amount, then each oscillator would also serve as a local oscillator for the diode being used as a mixer providing an Intermediate Frequency that may be fed to a conventional receiver.

These efforts were well rewarded with a number of contacts being conducted across 30-40 feet in the back yard. Modulation is achieved by impressing a little audio to the voltage supply of the Gunn diode oscillator. The resultant signal is FM with the deviation being determined by the level of audio. The overall sensitivity of the detection system left a lot to be desired, after all, a loud voice would have the same communication effectiveness!

More recently, with the advent of satellite TV systems, some microwave equipment for receiving signals on the 12 GHz satellite TV band has become available. Could some of this equipment be modified down a bit for use on the 10 GHz band? This equipment consists of a LNC or Low Noise Converter which is fitted at the antenna and is coupled to a tuneable TV downconverter. The signals normally received are FM and are converted to AM TV for feeding to a standard TV set by the downconverter. The improved sensitivity offered by this combination appeared to offer increased possibilities.

New Receiver

Fortunately at the local club, through the efforts of one of the members, a number of LNCs and downconverters were made available at good amateur prices. A little bit of minor surgery on an LNC with a few tabs of copper strip to lengthen the microstrip tuned lines shifted the tuning into the 10 GHz band. Other LNCs were treated with silver paint with similar effectiveness. As the local oscillator is at 11.2 GHz and the IF is 850-1400 MHz then only the front end needed to be tuned from 12.5 GHz to 10 GHz for the same IF to feed the downconverter.

Max Crewe VK3BBU .. "Success"

10 GHz Horn Antenna, and equipment used by the group as successful back up equipment.

Preliminary tests on the receiving equipment tracking a microwave intruder alarm sitting on the rear shelf of a mobile car showed signals receivable from over two kilometres away. Although the signal had no modulation apart from that imparted by the vibration in the car, at least a better receiving system was now available.

Now that a suitable receiving system was available, thought was again turned to suitable transmitting equipment. The receiving system is designed for FMTV so a matching transmitting system must be arranged. A Gunn diode would FM if the supply voltage was varied with signal. Unfortunately FM linearity suffered greatly when the deviation required by the receiving system was attempted. Better modulation could be obtained if the modulation was applied to a varactor diode mounted in the oscillator cavity with the Gunn diode. Microwave Associates provide a Gunnplexer assembly that has the required Gunn and varactor in the oscillator cavity and tuned to the 10 GHz amateur band. As these units were already in possession, then it was a relatively simple matter to build a video modulator to take signal from a video camera and provide correct modulation to the varactor. With a little bit of adjustment and fiddling, good pictures were being passed from one side of the shack to the other.

Again the advent of satellite TV yields further equipment for amateur use. Antenna systems used in the microwave region are commonly parabolic dishes. With true amateur spirit, a pair of small (4 foot) surplus satellite dishes were acquired. Similarly, use of suitable pieces of waveguide feed and radiator were also found.

First Attempt

In May, 1992, an attempt was made to establish contact from two points near Melbourne with a two-way video contact. Each party loaded all necessary equipment and at the appointed time, established contact using a two meter liaison frequency. Soon, pictures were being sent and received in one direction. Generator problems caused some concern initially at one site but the low voltage was soon overcome. When a change of direction in the opposite direction was called for, no signals were evident. Tests at the transmitting site confirmed that the transmitter was, in fact, working correctly. As the receiving station could not receive its own signal, it was obvious that the fault lay in the receiving equipment. Considerable effort was made to isolate and correct the fault over three hours in the cold, wet outdoors to no avail. A certain Irish gentleman had definitely visited us!

After returning to the relative comfort of the shack, it was found that an intermittent connector on the back of the LNC had chosen to become more permanent. Considerable discussion led to numerous new names for the particular type of connector used.

With the workload imposed upon one of the members of the group, another being temporarily relocated from Melbourne and the wet and cold of Winter, any further attempt would have to be delayed for some months. Weekend work and likely fine weather indicated that Friday, 23rd October would be a good day for the teams to attempt a two-way video contact and make some measurements for possible future work.

Antennas

From signal measurements made in the earlier attempt, a small horn was constructed to see if sufficient signal would be available over the path and compare it with the four foot dishes. An evening's work and some pieces of

circuit board produced a horn antenna of 21-22 dB gain. Care was taken so that no solder was on the inside surface of the horn as the lead alloy is an excellent attenuator at microwave frequencies. The inside joints were made with burglar alarm tape as used on windows. This material is an excellent jointing material at these frequencies.

Mal VK3BBU, Max VK3WOD and Peter VK3TAF arrived at Mount Worth, some 15 kilometres from Warragul in Gippsland at about 11.30 a.m. and began to set up the equipment. Jim VK3ZYC and Bill VK3JTW had already arrived at Johns Hill in the Dandenongs. Unfortunately, George VK3ZNE was unable to accompany us this time due to ill health. The dish was quickly mounted on the support frame on the tray of the truck and aimed in the direction of Johns Hill "somewhere over there". When the receiver was connected and tuned to the correct frequency, pictures were immediately seen. A little bit of left-right and up-down with the dish while observing the AGC of the receiver yielded studio quality video from Johns Hill to Mt. Worth on a frequency of 10.310 GHz.

We Did It!

Considering the quality and strength of the received signal using the dish antennas, a second receiver using the small horn antenna was set up. Considerable difficulty was experienced in assembling a supporting camping table. Those devices are definitely not recommended for field use! Again, good signals were received although it became obvious that some polarity rotation of the signal had occurred over the path. This rotation was about 70-80 degrees. In reviewing this much later, it was determined that this was most likely caused by angular terrain in the foreground at Johns Hill and the possible heat path over it.

Remember to leave a three second break between overs when using a repeater.

Having sent video of a hastily drawn QSL, the direction of transmission was changed. This is accomplished by removing the LNC from the waveguide feed and attaching the transmitting Gunnplexer. The returned signal from Mt Worth to Johns Hill was received just as well over the path. For the next two and a half hours, signals were recorded to videotape and attenuators placed in the transmit feedline. Although the original power levels transmitted from the Gunnplexer were 30 milliwatts to the antenna, power reduction to less than one milliwatt still gave excellent pictures.

During the day, weather conditions were very clear and temperature of about 27 deg C. No unusual bending or ducting of the signals were observed as was any variation in rotation from the 70 to 80 degrees noted above. This was fortunate as a misunderstanding between the two sites had led to the two main antennas being mounted with their polarities at 90 degrees! It was claimed that this misunderstanding had something to do with the type of waveguide mounts used.

Higher Frequencies

As the experiments on 10 GHz had proved extremely successful, consideration was given to exploring the possibilities of covering the 60 plus kilometres on an even higher frequency. No specific equipment had been taken for this possibility but some devices were found in the vehicles that would allow an attempt on about 500 THz (Terahertz!). A few minutes experimentation and reception of the letter S in morse was confirmed at Johns Hill. This contact was also recorded on videotape. Unfortunately conditions did not permit a two-way contact although it is believed that the Johns Hill group was not able to aim their transmitting antenna with sufficient accuracy. At the conclusion of these tests, the mirrors were re-fastened to their respective vehicles.

After a trip back from Mt. Worth, somewhat punctuated by various squeals of success from the driver, the meeting with the other party at Jim VK3ZYC's QTH relived through viewing the considerable amount of videotape taken, both on and off air at both sites. Consideration is now being given to finding other sites of even greater separation in an effort to determine just how far video signals may be sent on this band. An overall "figure of merit" in excess of one billion for the contact was derived by multiplying the distance by the frequency and dividing by the power. A similar figure could also be derived from the enjoyment of the occasion!

As a result of our activity, others have expressed interest in this fascinating area of communication with relatively simple gear that has a lot to be discovered. Thanks are due to many others who , in some way, have contributed, either knowingly or not, to the success of the exercise. No doubt, the increase in availability of equipment as used, will lead to others enjoying the fun and excitement of "doing something different".

The cover photograph and photographs accompanying this article were kindly supplied by Peter Ford VK3TAF.

Complimentary colour processing was provided by BOND COLOUR LABORATORIES, Richmond Vic, for which we offer grateful thanks on behalf of our readers.

ar

Product Review — The BAYCOM Packet Modem

By Gil Sones VK3AUI

BAYCOM HAVE produced a packet modem in a D9 plug which must be just about the most compact packet modem available. Even more impressive is the fact that it works brilliantly. The Serial Port provides the power supply and the radio just plugs into the DIN connector on the back of the modem.

Software to run the system is on a single disk. The system uses the PC to form up the packets and the modem is just to convert the serial port signals to and from audio. Because the modem is so small and simple there is enough power available from the serial port to run it.

This is a much simpler procedure than the usual TNC setup. A TNC usually is a dedicated computer and modem which converts serial data into Packet audio signals and incoming audio packets into serial data. Another program in the computer handles the serial data and looks after the TNC.

BAYCOM provide a software program which carries out the functions of both the usual packet program and the TNC. Only a relatively simple hardware modem is needed and the PC performs all the processing. A much neater solution.

My normal packet setup is a Paccom Tiny 2 TNC and I use PAKET as the PC packet communications program. The PC is an XT clone.

After finding an adaptor from my 25 pin serial port to the 9 pin serial required for the BAYCOM I was ready to go. The software loaded easily and I set my callsign. The manual revealed that the 5 pin DIN connections were identical with those I had coming from my transceiver. The BAYCOM started and I connected to a local BBS.

Operation was simple with but a few glances at the book and some recourse to the on screen help. The software and the modem performed without a hiccup and were very simple to use. If it was your first attempt then some more recourse to the book and the help file would be in order.

For the beginner or the more experienced who want a simple to use and troublefree system I would recommend the BAYCOM. The small size and simplicity make portable or even handheld operation possible. A Laptop and a handheld together with the BAYCOM make a very compact and portable packet setup.

Just about any sort of PC should work. Some odd ones and PC emulations may be tricky but then users of such systems know the traps. The program is not memory hungry and can be run in the background if needed.

The instruction book has been produced locally and is easy to use. The original program is from Germany and the book has been translated. However it is easy to follow as it has been very carefully translated and is not like one of those manuals from the east.

In summary an elegant and simple packet modem and system which has much to recommend it.

The modem and software are available from the Australian Amateur Packet Radio Association 59 Westbrook Avenue Wahroonga NSW 2076.

The cost is $190. **ar**

Amateur Radio and Electromagnetic Compatibility

PART 1

H F Ruckert VK2AOU
EMC Reporter
25 Berrille Road
Beverly Hills NSW 2209

MORE THAN 70 EMC reports have been published in AR during the past 10 years. Most reports dealt with one or more subjects from local experience and information obtained from overseas amateur radio publications. Few readers will have kept a complete file of all of these publications in order to have the information at hand, should they experience an EMC problem themselves. Now may be the right time to compile a summary, bringing minor subjects together under main headings.

How old are EMC problems?

EMC problems are as old as radio communication itself. When more than two ships or land stations were using Marconi transmitters at the same time, QRM resulted. The lack of selectivity, using only tuned antenna length, was the reason. Prof Slaby (Germany) and others had to introduce the L-C tuned circuit in order to separate the various operations. That was about 100 years ago. About 70 years ago radio broadcasting and amateur radio operation began in many countries, and at the same time EMC problems were experienced, called BCI. When, about 50 years ago, TV broadcasting was introduced in many countries, the so-called TVI problems became a war between the radio amateur and his neighbours. With the proliferation of electrical and electronic appliances and services, electromagnetic compatibility became a world-wide problem, which had to be dealt with by international regulations, or coexistence of many operations would have been disturbed.

What has been done by those concerned?

The EMC problem is worse in densely populated countries with a large radio amateur population. It is therefore not surprising that American amateurs first tried to help. P S Rand "Laboratory of Advanced Research" Remington Rand Inc, USA produced the famous book "Television Interference" with many contributions published in 1952-54. The writer had several long QSOs with Phil, and was grateful when Phil sent two copies of the TVI book. In West Germany it was mainly DL1BU, and later also DL9TJ, who attacked the problems in association with the professional Electronic Engineers Associations (VDE and DIN) and the Government (FTZ). QST reported in November 1952 the "RFI Bill" PL97-259, introduced mainly by K7UGA (Senator Goldwater) which was a great step forward as soon as the President had signed the document into law. TVI committees in the UK also did a great job in helping the amateurs with a number of excellent publications. There are now EMC conferences alternately in Switzerland and Poland, where experts from many countries meet to exchange experiences and to plan action by their governments. Now the countries of the European Common Market are laying down standards for electromagnetic compatibility of many appliances and electronic entertainment equipment. The German radio amateur experts requested an immunity level of 10 volts per metre, supported by experts from Poland and elsewhere. The DIN/VDE standards offer only 3 v/m, which helps in most cases, provided the manufacturers adhere honestly to this level (so far, this has not always been the case). Now we hear that the EEC plans to water the standard even further down, because some manufacturers have not yet done their homework. But some standard is better than none at all, as at present in many countries. It is pleasing to see that some manufacturers (German and South Korean) are doing very much better than required at no extra cost! So, nobody can say it can not be done, or it costs too much. The large Common Market in Europe makes it uneconomical to produce, import and sell below-standard equipment, because the EEC can ban such equipment. "Banana Republics" with no EMC standards are likely to receive the substandard electronic entertainment equipment which may be left over.

What is a "Disturbance", and what is "Interference"?

It is unfortunate that not only technically uneducated persons, but also radio amateurs, use the term "interference" when they are not to be blamed for EM incompatibility. Legal RF energy transmissions can never cause interference. The other term "disturbance" should be used, when legal RF radiation affects the operation of equipment which has insufficient immunity (selectivity) or any design fault making it incompatible with legal transmissions.

Examples

A radio amateur hears on the 14 MHz band, every 16 kHz, an S-5 signal, which comes from his own TV receiver or the TV set of a neighbour. This is interference, because TV sets are supposed to be only receivers of signals, which are transmitted on allocated TV channels. They are not to be transmitters, operating on frequencies which belong to a different service. One can check the unwanted radiation from TV sets by using a transistor receiver

with a long-wave range (popular in Europe). This signal (oscillator harmonics) should disappear at a distance of one metre or less, or one could not operate a hi-fi receiver close to a TV set.

Arcing in power line installations, often observed after several days of dry weather, is another case of interference. Walking along the street with a portable radio, one can usually identify where the arcing comes from. The electrical supply service is usually cooperative, and appreciates, if known, which power pole appears to be the trouble-maker (the poles are numbered). These arcs interfere with TV reception (especially Channel 2) and short-wave reception.

A compatibility problem occurs between a clean fundamental frequency legal amateur transmission and the operation of a hi-fi receiver or a TV receiver, or a VCR. In all these cases we have a "disturbance" (not interference) due to design deficiencies causing a lack of immunity or selectivity, or being too susceptible. The equipment owner should make the manufacturer responsible. The receivers suffer mostly in these cases from front-end overload, or lack selectivity and the ability to handle strong out-of-channel signals. "Disturbance" means that the receiver is to be blamed (not the transmitter).

Should a transmitter radiate too strongly, harmonics which fall on a frequency allocated to a receiver service, then the transmitter operator is responsible. He has to improve his transmitter selectivity (suppressing harmonics) to an acceptable level, to overcome this case of "interference". By using the terms "disturbance" or "interference", one places automatically the responsibility to overcome the EMC problem on the guilty party. It is therefore undesirable to use always the term "interference", which can be quite wrong, and have legal consequences. (In German: Interferenz/Storende Beeinflussung). First, we must keep our own house in order.

When we intend to purchase an appliance (TV, VCR etc), it would help if we could find out from an amateur friend how well his appliances behave as far as EMC is concerned, noting make and models. There are substantial differences which often have nothing to do with the price. It was revealed by the Consumer Association in Germany (Warentest: Tested wares) that the type approval number connected with EMC performance was not even a guarantee for meeting the test requirements. We are not likely to get a written guarantee from a sales manager to take the appliance back if it turns out to be impossible to improve the EMC rating and performance. EMC performance seems still to be a matter of luck. Some TV sets pack up at 0.1 V/m in the test cell, whilst other models from other manufacturers can take over 50 V/m. Not all have done their homework, but the EEC market will force some improvement to be made — we hope!

EMC Test; the first job after obtaining or building a transmitter

We should not leave it to neighbours to find out what is being radiated along which path from our new transmitter (transceiver and/or amplifier). Instead, connect the transmitter via a short well shielded piece of coaxial cable to a shielded dummy load, and run the transmitter with a two-tone oscillator on phone or with dots on CW, using the maximum power the maker recommends. With an absorption frequency meter (Fig 1) or a dip meter (GDO) check the leaking RF along any attached cable (mains, power supply, mike, speaker, headphone, transverter, monitor-scope, computer etc) at the control knobs, dials, gaps between the chassis and the bottom cover or lid, and at attached SWR meters. An absorption type frequency meter (tuned LC circuit, Ge diode and 50 μA meter can detect signals as low as 10-20 mV. A dipmeter also tuned to the transmitter fundamental and to the harmonics can do the same. Any attached cable showing this order of leakage will have to be wound through a ferrite core of suitable size using 10 or more turns. Low Q and high μ ferrites like those used in TV line frequency transformers are suitable. Low pass filters, with high stop band attenuation at least to 500 MHz, should be attached directly to the transmitter output terminal (no coax cable between transmitter and filter). That is about all we can do with a manufactured transmitter (transceiver plus final amplifier), hoping the manufacturer did his part.

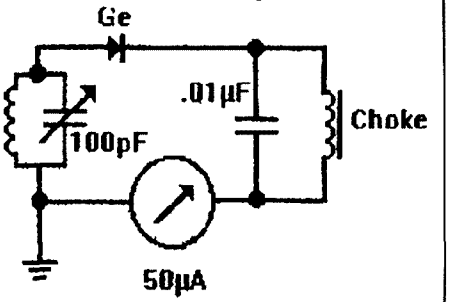


Figure 1 — Absorption Type Frequency Meter

Those of us who are not only "appliance operators" but "radio amateurs" in the original sense can do as much as the technology provides. The high RF power carrying components should be either confined by an unpainted perforated metal box on top of the chassis, or the cabinet internal edges should be unpainted (front panel, bottom and top cover and chassis) and a sufficient number of screws must be used to avoid RF leakage at the cabinet edges. The higher the frequency, the closer must the screws be placed to seal the cabinet (3 cm at 435 MHz).

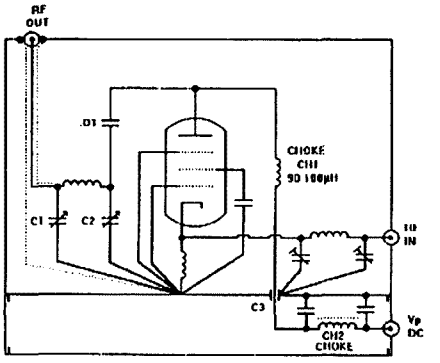


Figure 2 — Earthing Point

The chassis floor and the front panel must not become part of the high RF current carrying path from the valve or the Pi filter components (Fig 2) or shielding becomes impossible. These components should be interconnected by wide copper strips and not by thin wires (reducing the unwanted circuit inductance).

Fig 3 shows how a vernier dial can be attached to the Pi filter variable capacitors C1 and C2. An insulating flexible coupling should be used to prevent high RF voltage from the capacitor feeding through the front panel to the vernier dial, making it "hot" (ie leaking RF power). The RF choke Ch 1, should have 90 μH inductance and

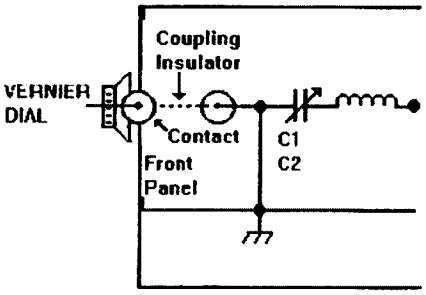


Figure 3 — Vernier Dial Connection

must be wound on a coil former of low RF loss material like steatite ceramic. Plastic material which could melt when warm, or has high RF losses, could cause serious problems. RF chokes of the Christmas tree type can also cause difficulties, because each coil has its own parallel and series resonances, making the choke ineffective perhaps at a desired operating frequency. A 90 μH single layer choke wound on 2-3 cm diameter former works fine from 3 to 30 MHz. Fig 2 shows choke Ch 2, because it has been found that choke Ch 1 and the feed-through capacitor on the chasis still allow too much RF to escape at the Vp terminal, when a separate HT power supply is connected via a cable to the amplifier. This choke is wound on a low Q ferrite rod of 12 mm diameter and 20 cm length, using 30 turns. C4 is one more bypass capacitor. These are some fundamental considerations the home constructor should not forget.

How well does the industry deal with the problem of RF leakage?

DL1BU published a very detailed paper in "CQ-DL" magazine No 12/1982 testing several popular commercial power amplifiers with calibrated professional equipment. The table (Fig 4) shows the relationship of watts, dB above 1 mW, power in watts, dB above 1pW (pW = picowatt = 10^{-12} watt), terminal voltage across 50 ohm and dB above 1 μV.

The regulations require the reduction of harmonics by 40 dB for transmitters of over 25 watt, operating on short waves, and 60 dB reduction is called for VHF/UHF transmitters. A 100 W transmitter operating on short waves is allowed to have 10 mW and a VHF transmitter 0.1 mW of harmonic power at a 50 ohm dummy load. The operating regulations require very severe

WATT	dB über 1 mW	Leistung	dB über 1 pW	Spannung	dB über 1 µV
10^{3}W	+ 60 dBm	1 kW	150 dB(pW)	300V	170 dB(µV)
10^{2}	+ 50 dBm	100 W	140 dB(pW)	100 V	160 dB(µV)
10^{1}	+ 40 dBm	10 W	130 dB(pW)	30 V	150 dB(µV)
10^{0}W	+ 30 dBm	1 Watt	120 dB(pW)	10 V	140 dB(µV)
10^{-1}	+ 20 dBm	100 mW	110 dB(pW)	3 V	130 dB(µV)
10^{-2}	+ 10 dBm	10 mW	100 dB(pW)	1 V	120 dB(µV)
10^{-3}	0 dBm	1 mW	90 dB(pW)	300mV	110 dB(µV)
10^{-4}	- 10 dBm	100 µW	80 dB(pW)	100mV	100 dB(µV)
10^{-5}	- 20 dBm	10 µW	70 dB(pW)	30 mV	90 dB(µV)
10^{-6}	- 30 dBm	1 µW	60 dB(pW)	10 mV	80 dB(µV)
10^{-7}	- 40 dBm	100 nW	50 dB(pW)	3 mV	70 dB(µV)
10^{-8}	- 50 dBm	10 nW	40 dB(pW)	1 mV	60 dB(µV)
10^{-9}	- 60 dBm	1 nW	30 dB(pW)	300µV	50 dB(µV)
10^{-10}	- 70 dBm	100 pW	20 dB(pW)	100µV	40 dB(µV)
10^{-11}	- 80 dBm	10 pW	10 dB(pW)	30µV	30 dB(µV)
10^{-12}	- 90 dBm	1 pW	0 dB(pW)	10µV	20 dB(µV)
10^{-13}	- 100 dBm	100 fW	-10dB(pW)	3µV	10 dB(µV)
10^{-14}	- 110 dBm	10 fW	-20dB(pW)	1µV	0 dB(µV)
10^{-15}	- 120 dBm	1 fW	-30dB(pW)	300nV	-10 dB(µV)
10^{-16}	- 130 dBm	0,1 fW	-40dB(pW)	100nV	-20 dB(µV)
10^{-17} W	- 140 dBm	0,01 fW	-50dB(pW)	30 nV	-30 dB(µV)
	- 150 dBm	0,001 fW	-60dB(pW)	10 nV	-40 dB(µV)

Figure 4 — Power Comparison Table

harmonic power level reductions if TVI has been caused by transmitter harmonics. Now the harmonic level must be reduced to 1.25 x 10^{-9} watt = 1.25 nanowatt. The level of 1.25 nanowatt is also 31 dB above 1 picowatt. At a 50 ohm dummy load this power level gives 250 μV (microvolt). In the case of a 100 watt transmitter the level amounts to 140 dB (pW) or 71 volt at 50 ohm. A 40 dB harmonic reduction is no longer good enough, and we have now 140-31 = 109 dB. A power amplifier running 750 watts requires a harmonic reduction of 118 dB, which takes some doing!

A well designed low pass filter could provide the required harmonic reduction if the filter is directly attached to the amplifier cabinet, provided the cabinet and the attached cables (from power supply, mike, key, monitor scope, SWR indicator) are practically free of RF and not leaking. The spectrum analyser photos show what we can expect from commercial RF power amplifiers.

Fig 5 shows the level of RF power measured at the cable which connects the Drake T4XC transmitter to the separate power supply. The fundamental and harmonics over 500 MHz are shown, when the transmitter was operated at 14 MHz.

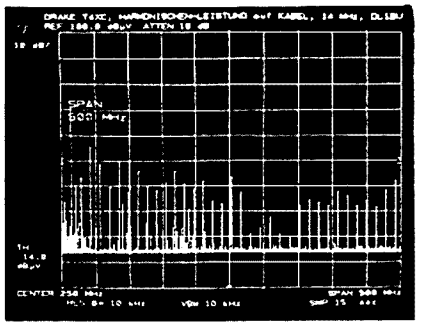


Figure 5 — Refer Text

Fig 6 shows what happens when the power amplifier TL-922 is driven by the T4XC and a two-element quad antenna is used. The amplifier adds 8 dB of power increase to 78 dB (pW). A similar result, only 10 dB lower, was found when the measurement was carried out at the coaxial antenna cable near the transmitter. It shows that with this level of leaked RF outside the feeder coaxial cable, an added low-pass filter cannot improve the harmonic radiation to any marked degree. Under these conditions the antenna practically no longer radiates harmonics, but the antenna cable and transmitter cabinet do.

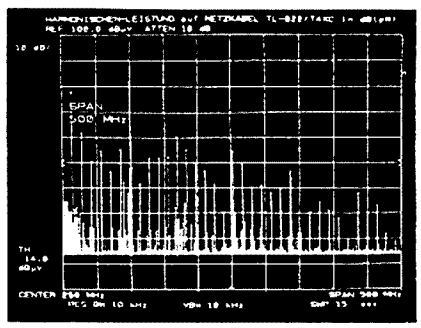


Figure 6 — Refer Text

Fig 7 shows what happens in the case of a transistorised amplifier IC-701, operating with 100 watts at 28 MHz. The harmonic power level measured at the connecting cable to the separate power supply is between 40 and 60 dB around the 200 MHz TV band; this means 50 dB (pW). This leakage power is also found on the cabinet and antenna cable. Similar results were measured on the amplifier L4B running 700 watts on 21 and 28 MHz. My own experience with the HL12U 435 MHz amplifier confirmed that plenty of RF is at the cable to the power supply and also the heat-sink-case (being anodised) does not make any contact with the bottom plate, so leaks RF.

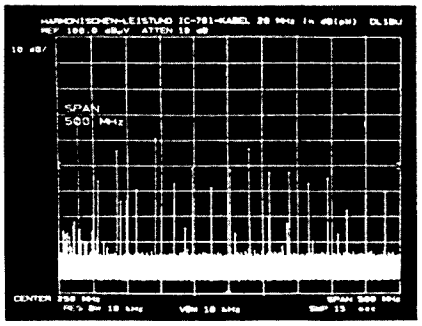


Figure 7 — Refer Text

Experience shows that it does not help to place a low-pass filter between the transceiver-driver and the power amplifier. The PA generates all the harmonics regardless of an additional filter. If the transmitter cabinet itself does not radiate substantial harmonics already, it could help to place two low-pass filters in series directly at the PA output terminal.

(to be continued)

ar

Technical Abstracts

Gil Sones VK3AUI

Getting The Low Down

NEW ZEALAND amateurs have an allocation from 165 kHz to 190 kHz and have been conducting interesting experiments there. The band presents many challenges with the antenna system being the major hurdle. Equipment also represents a challenge as it must be home brewed. Receiving is possible with many amateur transceivers but the provision of coverage is just an afterthought to the makers.

Locally John Adcock VK3ACA has been experimenting for some time and has an experimental licence. The experimental licence callsign is AX3T35. The frequency allocated and used by John is 196 kHz.

Recently John VK3ACA has been assisted in conducting test transmissions on 196 kHz by Don VK3BDJ. The tests have consisted of a series of transmissions from Don's QTH at Gordon near Ballarat. These transmissions have been heard in New Zealand and interstate.

Antenna efficiency is a major problem at these low frequencies. Noise is also a problem as many switching power supplies and other devices have outputs in the region.

In New Zealand tests have taken place on 166 kHz and 181 kHz. These frequencies being chosen to suit the scene in New Zealand.

Use of 166 kHz presents some problems as the third harmonic must be very well suppressed to avoid interference to 500 kHz which is an important marine frequency. To achieve this Andrew Corney ZL2BBJ built and published the design of a low pass filter in Break In August 1992. The design is for transmitting but for receiving it would minimise Broadcast station breakthrough and lower rating components could be used.

The filter is shown in Fig 1. The 3 dB point is at 254 kHz and it is better than 50 dB down at 500 kHz. The original used pot cores and 500 V capacitors to handle 100 W of RF. For receiving small ferrite toroids or even RF chokes and small "Styroseal" capacitors will suffice.

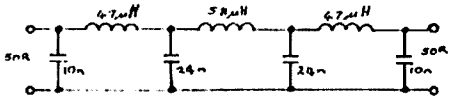


Fig 1 Low pass Filter -3 dB at 254 kHz

Receiving Low Frequency can be a problem but a simple converter can be used to allow the use of an HF receiver as an IF. Andrew Corney ZL2BBJ has designed a suitable converter which was published in Break In September 1992.

The converter uses an old 2 gang broadcast variable capacitor together with an FET, an NE602 IC and a crystal plus a few incidental components to shift the LF signals to the 80 metre region. The coils used could be small RF chokes. See Fig 2 (on p 16) for the circuit.

If the FET tends to oscillate try a 2n2 capacitor across the 680 ohm source resistor.

The output transformer is wound on a TV balun core. An FT50-43 toroid could be used if desired.

The crystal used can be anything which gives a suitable IF in the region of the 80 metre band. For example a 4 MHz computer crystal will tune backwards in the 3.8 to 3.9 MHz region. A 3.579 colour crystal will work but calibration will require some mental gymnastics.

For those needing other circuits and details of loops then the articles in AR by Lloyd Butler VK5BR are a good start.

UHF Collinear Antenna

From near the bottom of the spectrum we now go to a couple of stops from the top. A 28 element design for 2.4 GHz was published in the JA magazine The Radio Amateurs Magazine in their August 1992 issue. The author was JA7YTB.

The design is interesting in that 5/8 wavelength elements and 3/4 wavelength elements are used. The feed is the old Zepp feed also used in the J-pole and Slim Jim designs. However the end feeding of so many sections is quite a feat.

The design is shown in Fig 3. The antenna would appear to have been bent up out of a length of rod or wire and then slid into a fibreglass tube radome for support. SWR could be adjusted by the relative spacing of the quarter wave matching section or the diameter of the quarter wave spike.

Scaling the design to both 1296 MHz and 432 MHz should be possible. Reducing the number of collinear sections should also be possible and may also make it easier to achieve a gain figure consistent with the number of sections. I well remember at antenna gain contests that some Yagi builders got more gain from only half their monster antenna than from the full monster. A graphic demonstration of diminishing returns.

With large collinears the problem to be overcome is to excite the whole an-

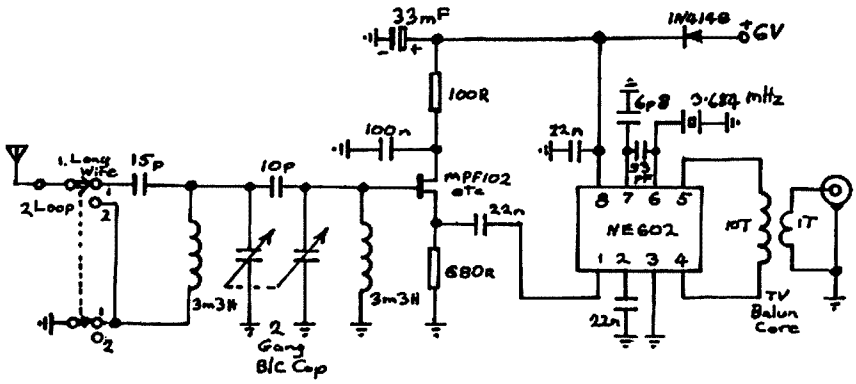
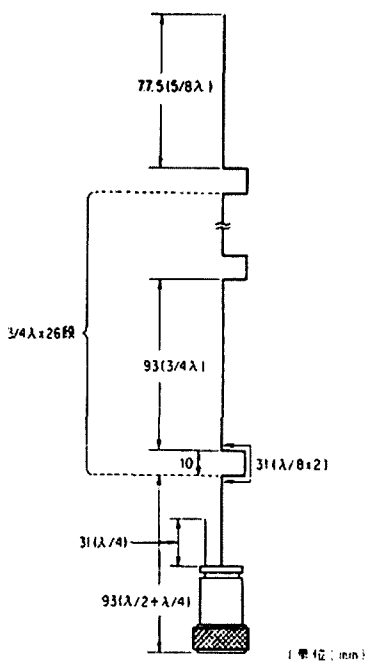


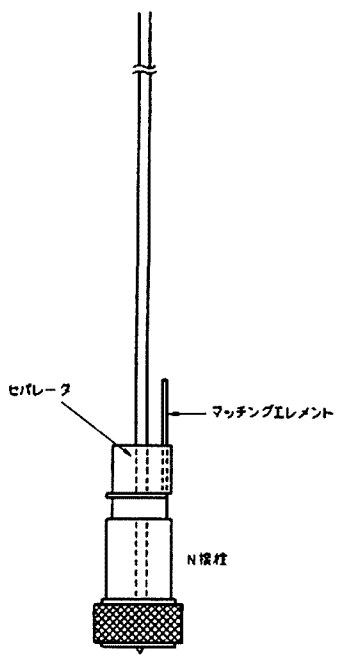
Fig 2 LF Converter

tenna. If the end has only a fraction of the power fed to elements nearer to the feed both gain and pattern suffer.

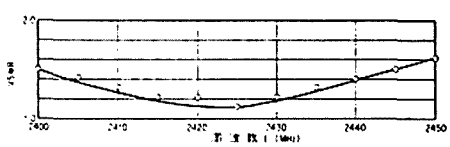
In any event JA7YTB has produced an interesting design which could be the basis for many experiments.



第1図 試作したアンテナの構造



第2図 給電部の構造



第3図 調整後のVSWR特性

Fig 3 28 Element Collinear

Microphone RFI

RF feedback has been experienced by some users of desk microphones. These microphones often contain a preamplifier and this is often where the problem lies.

Multiple DC and control lines to the microphone for PTT and other functions can also pick up and couple RF into the microphone amplifier.

A shack hot with RF is a prime cause of trouble and should be tackled first. A good and efficient earth is an excellent first step. If your earth is still at some RF potential at the rig, other measures may be needed. To bring the equipment to RF ground you can attach to the rig grounding point a series of quarter wave wires for all the bands in use. The wires are run around the room around the skirting or under carpets. Do not let any one touch the ends as they could be at a high RF potential.

For those still experiencing difficulties then a series of articles and items in QST may help. The original article was in QST May 1988 and was followed by Tech Correspondence in March 1992 and Hints and Kinks in July 1992.

Microphones suppressed successfully were an ICOM IC-SM6 and a Kenwood MC-80 together with a homebrew microphone project.

Principally the cures involved bypassing all wires entering the mic. In particular the PTT lines and the DC supply. Internally beads and RF chokes were also used.

RF chokes and ferrite beads were used to filter supply lines together with added bypasses. Audio leads must be treated carefully so as not to affect the audio frequency response or risk inducing hum. Toroids should be used in preference to solenoid style chokes to avoid inducing hum. Similarly RF bypasses in audio leads are a tradeoff between RFI and frequency response.

The QST references are a good guide for anyone faced with the problem. Particularly if it is in either of the two microphones mentioned. Remember that reducing the RF in the shack is the first step even if it is not a complete cure.

ar

Mini Equipment Review

The MFJ-247 SWR analyser with LCD frequency counter

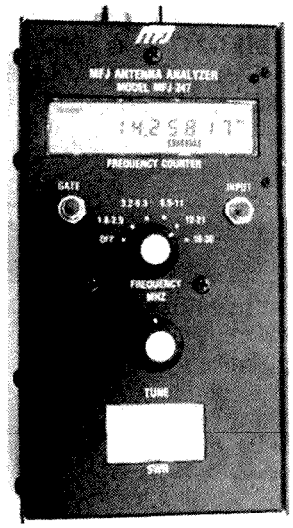
Ron Fisher VK3OM

IN THE MARCH 1992 issue of Amateur Radio, I reviewed the MFJ-207 SWR analyser. At the conclusion of that review, I mentioned that MFJ would soon be releasing an upgraded version which would incorporate an LCD digital readout. The MFJ-247 is that model. The digital readout can be used in two ways. Firstly, it will read the frequency to which the internal oscillator of the SWR analyser is tuned, but it can also be used as an external frequency counter which is useable up to 150 MHz.

However, for those who haven't got the original MFJ-207 review handy, let's take a quick look at just what an SWR analyser does. The oscillator in the analyser is actually a low-power transmitter which is connected to the antenna, the feedline, the ATU, or a combination of all three, to determine if a 50-ohm match exists. A bridge circuit is coupled to the front panel meter which is calibrated in SWR at the following points: 1, 1.2, 1.5, 1.7, 2, 2.5 and 3, which is at about three-quarter scale on a scale length of about 25mm.

The frequency range of 1.8 to 30 MHz is covered in five ranges, as is the MFJ-207, but where the latter offered full coverage between these frequencies, the MFJ-247 has a few gaps. The actual coverage is 1.8 to 2.9, 3.2 to 5.3, 6.5 to 11, 12 to 21 and 18 to 30 MHz. In actual practice there is some slight extension on this coverage both above and below these frequencies. However, it could be a limiting factor for commercial users trying to tune an antenna on an RFDS channel in the 5.5 MHz region.

With the counter built in, the 247 is slightly larger than the 207. It is 101mm wide as against 63mm for the 207. At the same time, the depth is actually 12mm less. External connections are an SO-239 to connect to the antenna under test, a BNC connector for external input to the frequency counter, and an external DC power input which is still not labelled for polarity. Internal battery power has been changed from a nine-volt transistor type battery to six AA cells. It's still necessary to remove eight screws to put new batteries in. Current drain is about 170mA, so the use of alkaline batteries as recommended by MFJ would certainly be a good idea.



The MFJ Model MFJ 247 Antenna Analyser — Front View.

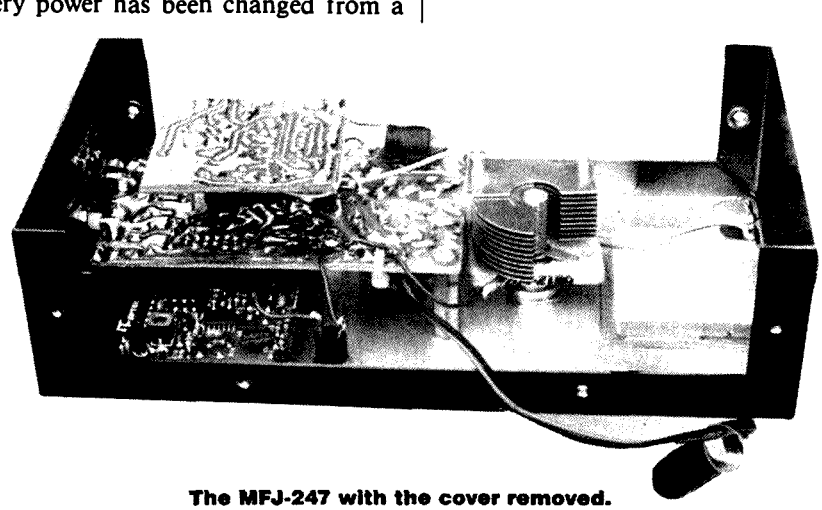
The MFJ-247 in operation

I put the 247 into use with the several HF antennas available around the shack, and the results were most interesting. The frequency counter allows you to set the analyser to your exact operating frequency. However, I found that, in most cases, the analyser gave very different measurements from normal in-line SWR meters. The analyser will get you in the ball park, but you will still need your normal SWR meter to get your antenna tuned to your operating frequency. The frequency counter itself is a rather nice unit. With a whip antenna connected to the BNC input, and the counter input selected to external, I could easily read the frequency of my two-metre equipment. The error at two metres was about 1.5 kHz, but I expect the counter time base could be adjusted to put this right.

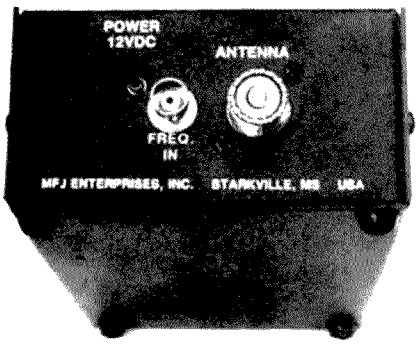
The Instruction Manual does not mention that the time base uses a 10 MHz crystal with .01, .1, 1, and 10-second gate times, but these points are covered in the advertising brochure.

Instructions on the use of the analyser are good. You won't have any trouble here except in trying to determine the polarity of the external DC input; however, I will let you into a secret. The tip of the plug is positive.

After a bit of use, I noted a few strange quirks with the 247. Occasion-



The MFJ-247 with the cover removed.



Rear View of the MFJ-247.

ally, the counter would lock up and refuse to read the operating frequency of the analyser. The only way to overcome this was to switch off and start again. The first review sample was quite bad in this respect, so I exchanged it for a second one which was much better.

Also, MFJ has dropped the vernier from the tuning control on this version. I feel that a six-to-one drive would provide much smoother control.

The MFJ-247 conclusions

I would have to say that MFJ has a great idea here. However it is let down by a few details that could be easily corrected with little or no extra expense. The instruction manual should have more information on the counter operation.

Even so, I would like one for my shack, and at a retail price of $409.20 it would have to be good value.

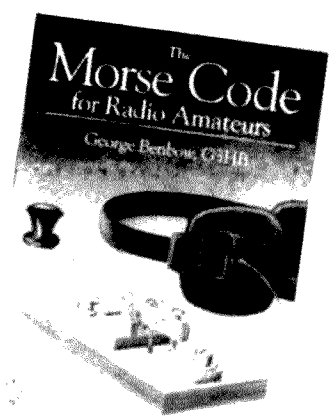
Our MFJ-247 was supplied by Stewart Electronic Components, 44 Stafford Street, Huntingdale, Victoria 3166.

ar

BOOK REVIEW

The Morse Code for Radio Amateurs

Seventh Edition
Edited by George Banbow G3HB
Published by the Radio Society of Great Britain (RSGB)
Reviewed by Evan Jarman VK3ANI



THE MORSE CODE for Radio Amateurs was first written in 1947 by Margaret Mills G3ACC; the first woman to obtain a transmitting licence following the war. In 1991 it was revised and had its scope extended although the majority of the content is still practice exercises.

This book was written for those who have no experience of Morse code and are seeking to pass the amateur examination.

The chapters that are not code exercises are limited in their scope perhaps to match their size. The history of Morse code is one page. So too is the first chapter which outlines some of the advantages of Morse code. A description of the Morse key does slightly better. It acknowledges the American straight key but prefers the solid arm GPO type of key. It includes a schematic circuit for a practice tone oscillator based on a 555 timer IC.

The last chapter on high speed Morse and automatic keys provides a better description, but is still information for newcomers to demonstrate what is available.

The chapter on the examination options applies to Britain and so should be ignored by Australians.

The sending exercises are where this book shines. It breaks up the alphabet and picks various letter groups to practise. Then having completed these groups, text using all letters is given. Finally numbers are added. Exercises also give the time required for transmitting at different speeds. The letter groups have been chosen using a common pattern in Morse. Also letters have been combined so that if spacings are not correct quite different letters or words will be heard, eg MIZMI becomes ZZZ.

These exercises would make good receiving practice. Words like REPEAT and REPENT will sort out any tendency to journalise before it could become a problem. The exercises form 13 of the 28 pages in this book and are worth every page.

No book can provide receiving practice which is the most basic skill in Morse code. It can only point out sources such as scheduled practice sessions on radio or recordings. Again this book is aimed at the British reader and only lists British sources.

The aim of the book is to interest people in the Morse code as a new and different language with which one can communicate world wide. I wish them well but feel that the book is too small to satisfy the interest generated.

There are many amateurs around the world who find it very relaxing and only wish that others could share this enjoyment. What must be the best example of Morse code operation to some is shown in an extract from the book. "In contact with an American amateur, he had commented on his Morse and the American replied that he was in an iron lung and keying the transmitter by blowing down a tube."

ar

More on Interference Cancelling, and a New Circuit

Lloyd Butler VK5BR
18 Ottawa Ave
Panorama SA 5041

Introduction

IN A PREVIOUS article (AR September 1992) I described an interference cancelling system which operated by combining the signal from the main antenna with the signal from an auxiliary antenna. To achieve cancellation, the amplitude and phase of the auxiliary antenna signal was adjusted so that the interference components from the two antennas were cancelled by the combination.

The main complication in this type of system is the circuitry needed to adjust relative phase of the two signals over the complete range of 360 degrees. In the previous article, I submitted a circuit which made use of resistance-capacity (RC) phase shift networks to achieve this adjustment. The system as designed worked well, but the number of transistor circuit components needed to interface these networks turned out to be greater than I had first anticipated. This has led me to search for a simpler method of controlling the phase or at least one with less components.

I now introduce a new circuit which makes use of the phase shift that occurs when a tuned circuit is set off resonance. This gets back to the type of phase control used by Drew Diamond in his early circuit (AR, October 1976). However, Drew's circuit required the adjustment of a matching unit consisting of two variable capacitors and a rather large inductor on which taps had to be set. Just how much phase was achievable by this circuit was also not defined. My new circuit, despite its simplicity, can be adjusted over a full 180 degrees of phase shift with a single tuning control. Of course, once this is achieved, the remaining 180 degrees is accessible by operating a phase reversing switch.

The Phase control

In principle, phase adjustment is very simple. If a signal is loosely coupled into a parallel tuned circuit, the phase produced across the tuned circuit can be easily shifted over a 90-degree range as the circuit is tuned, from part-way down one side of the resonance curve, through resonance, to part-way down the other side. The effect can easily be demonstrated by loosely coupling a signal generator into a tuned circuit and simultaneously monitoring, with a dual trace CRO, the signal generator output and the signal across the tuned circuit. The precise amount of phase shift for a given frequency offset can be derived from the curves (Figure 1) reproduced from Terman.

To achieve 180 degrees of phase shift, we use two identical tuned circuits with their tuning capacitors ganged together. The two tuned circuits must be loosely coupled or separated by an amplifier isolating stage. The 90-degree shift in the second circuit is additive to that in the first circuit, giving us 180 degrees of range. Of course, the amplitude also varies across the resonance curve. In practice, this is no problem as the phase and amplitude controls have to be progressively adjusted, in turn, a number of times, until the interference null is achieved.

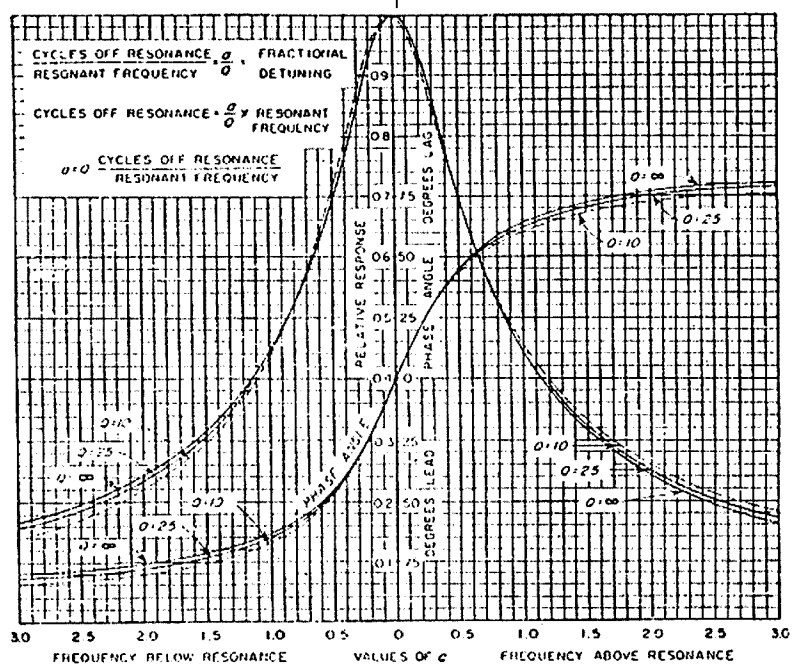


Figure 1 Resonance Curves Showing Phase Shift (from Electronic & Radio Engineering — Terman).

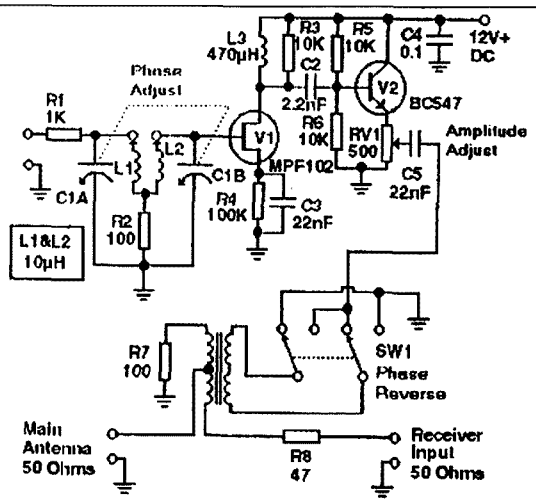


Figure 2 Interference Cancelling Circuit
C1-2 Gang 15 to 280 pF, or similar
L1, L2-Miniature RF Chokes 10 µH tunes 3.5-7 MHz
T1-11 Turns quadfilar wound on Amidon FT50-75m Toroidal Core

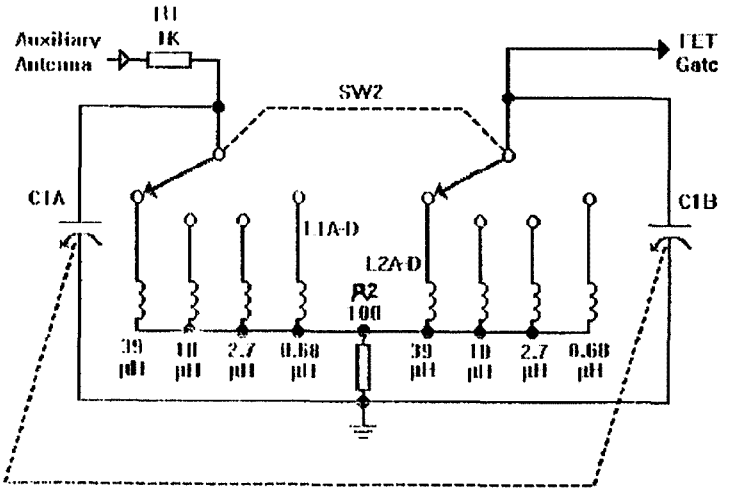


Figure 3 Band Switching
39 µH-1.8 to 3.5 MHz 10 µH-3.5 to 7 MHz
2.7 µH-7 to 14 MHz 0.68 µH-14 to 28 MHz

For the new circuit detail, refer to figure 2. In this diagram, L1-C1A and L2-C1B are the two tuned circuits coupled by resistor R2. Inductors LI and L2 are identical and capacitors CIA and C1B are a ganged variable pair. In practice, tracking of tuning does not appear to be critical and hence there is no need to be too concerned about precision matching of the inductors. The circuit, as shown, runs with a fairly low Q, and almost any identical pair of inductors can be used provided they are selected with the right inductance for the frequency concerned. Matched aerial and RF coils from an old valve receiver can be put to good use here. In this case, the primary winding of the aerial coil can be used to couple the auxiliary antenna instead of using coupling resistor Rl.

Inductors specified in figure 2 (and figure 3) are miniature RF chokes which can be purchased from electronic stores for about one dollar each. These are very convenient because they are no larger than a resistor or small capacitor, can be supplied in precise values of inductance and save the effort of having to wind the coils. The inductance value (10 µH) shown in figure 2 allows tuning between the 3.5 and 7 MHz bands. The resonant tuning range is greater than this, but a tuning overlap must be allowed for phase adjustment either side of resonance at the extreme ends of 3.5 and 7 MHz. For 1.8-3.5 MHz we can use 39µH, for 7-14 MHz — 2.7 µH and for 14-28 MHz — 0.68 µH. If complete HF band coverage is required, a four-pole two-position switch can be used as shown in figure 3.

Interface & Mixing

Two transistor stages follow the phase shift tuning system. FET stage V1 provides high input resistance to prevent loading of the tuned circuits and provides voltage gain which is needed in reserve in the system. Emitter follower stage V2 provides a low source resistance to drive the receiver input via the mixing circuit. Potentiometer RV1 is used to set amplitude in adjusting for interference null. The potentiometer must be a non-inductive type (not wire wound) with preferably a tapered resistance characteristic to improve adjustment resolution when set near minimum. If a tapered pot is not available and difficulty is experienced in adjusting near minimum setting, the gain of the amplifier can be reduced by reducing the value of resistor R3 or providing a switch to connect in a lower value. The final component in the phase control chain is switch SW1. This reverses the phase of the auxiliary signal to extend the 180 degrees of phase adjustment to 360 degrees.

The circuit around transformer T1 is similar to that used in my previous system. It is balanced so that minimal amplified auxiliary signal is fed to the main antenna. This is necessary to prevent feedback via the two antennas, and instability in the system. To simplify the circuit, the matching transformer feeding the 50 ohm receiver input in my previous system has been omitted and resistor R8 has been added to achieve the correct match. this adds an extra 3dB loss to the inherent 3dB loss already in the main antenna circuit and caused by the balancing system. On the HF bands, noise picked up by the antenna normally overrides receiver noise so that the total 6dB loss should not normally be a problem.

Transmit-Receive Facility

For the DX listener, Figure 2 in conjunction with Figure 3 makes up a complete system. However, for amateur station use, extra circuitry is required to switch out and provide protection for the interference cancelling unit when transmitting. The switching and protection circuit shown in figure 4 is similar to that used in my previous system. This has again been included to make the article complete. Relay A is operated on transmit by normal contacts of the TX/RX relay in the transceiver. On transmit, relay contacts A2 and A3 switch out the balancing and mixing transformer and connect the transceiver direct to the main antenna. Relay contacts A1 disconnect the auxiliary antenna and earth the auxiliary input. Diodes across the interference cancelling input and output circuits provide additional surge protection.

Merits of the New Circuit

Performance of the new unit is much the same as my previous unit, but it is

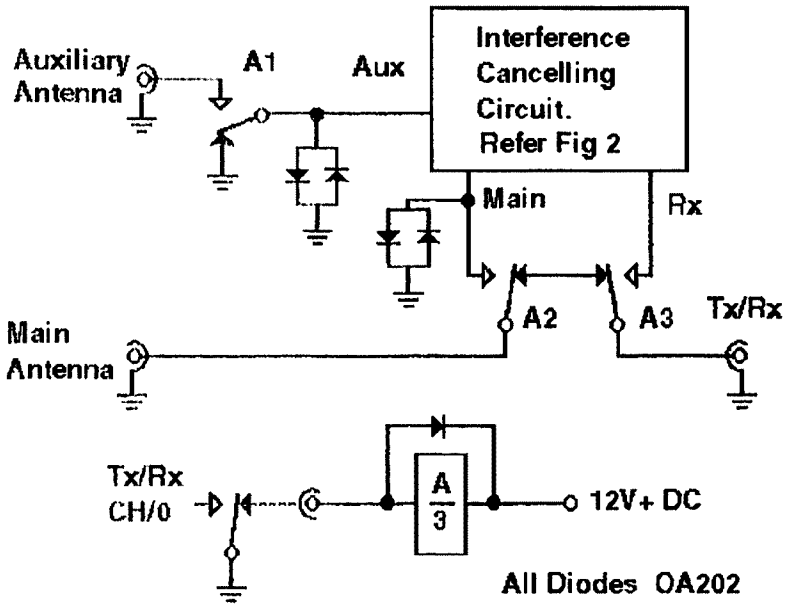


Figure 4 Transmit-Receive Switching

assembled with less components and has less controls to adjust to set up for interference null balance. In the previous system, the input tuning had to be peaked up, one of four phase quadrants had to be selected, and phase and amplitude controls had to be trimmed. In the new circuit, there is only a two-position phase reversal switch with phase and amplitude controls to be trimmed.

In the previous unit, a tuned input from the auxiliary antenna was found to be necessary to prevent cross modulation from local broadcast stations and other signals which caused "birdies'. In the new unit, the input tuning system combines this function with phase control. While the tuning might be set a little off resonance, it still provides rejection of out-of-band signals.

To set for a balance, the phase and amplitude controls are adjusted for lowest noise, one after the other a number of times, until an interference null is achieved. If a null is not found, or the null is not very definite, the phase is reversed with the reversing switch and the procedure repeated. For further details on the sort of results which can be achieved, I refer you to my previous article (reference 1).

Summary

A new interference cancelling system, using circuit detuning for phase adjustment, has been described. It requires less components and, in operation, is easier to adjust than my previous system using RC phase shift circuits. If you have a local interference problem and are interested in a cancelling system, I suggest you give this circuit a try.

References

1. Lloyd Butler VK5BR — An Interference Cancelling System for Your Receiver or Transceiver — Amateur Radio, September 1992.
2. Drew Diamond VK3XU — A Method of Reducing HV Power Line Noise — Amateur Radio, October 1976.

ar

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

Info on Rotators

12 Park Avenue
Rosslyn Park SA 5072

AFTER THE TH6 went up, I had no rotator, so the rotator pipe was extended to the mast foundation, resting on a steel plate and sitting in a hole of a jarrah block, all bolted down. With two cyclone pipe fittings and two short lengths of suitable pipe, one was pinned down by a 1/2" U rod 9" long, the other acted as a pointer. Both pipes were able to turn inside the tower legs. When not in use, I slid a long smaller pipe inside one so the coax could not get wound up. My SH rotator has been in use four years, bolted to the foundation. I still use a pointer pipe, which is roped at times to take any strain off the rotator.

My 18/24 MHz two-el yagis at .075 spacing on one 8 ft boom has a 22' length of tube mast sitting inside a 6' length of 2" pipe. By slotting the top of 2" pipe four times, I slide in a short length of 1/2" rod. By lifting same with my hands, they give me LP and SP to Europe and America. As simple as that.

ar

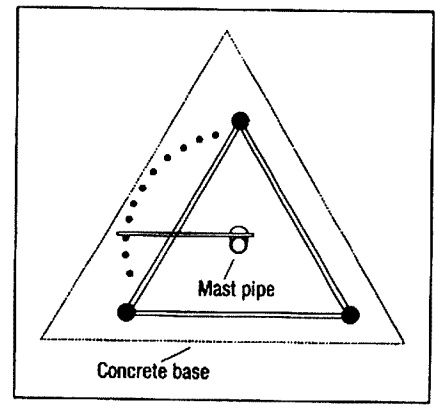


Fig 1 Top View of the tower depicting the manual rotation method.

A Test Load for the 20 Amp Power Supply. Ideas for the Experimenter

How to get rid of around 300 watts. VK5BR has an answer.

Lloyd Butler VK5BR
18 Ottawa Ave
Panorama SA 5041

A STANDARD POWER supply for many transceivers is 13.8 volts at a maximum load of 20 amps. Radio Amateurs often build their own 20 amp regulated power supplies and various designs for these have been described in past issues of Amateur Radio (References 1 and 2). My own version of such a supply based on these designs was recently assembled but a problem seemed to emerge. How does one test such a unit to ensure that it can safely deliver 20 amps and how does one check its regulation? What is required is a 0.7 ohm resistor which can dissipate 276 watts. Just where does one get one of these ?

The solution was found in a coil of 16 SWG galvanized iron wire which was purchased from the local hardware shop for some other project around the home. The resistivity of iron is around eight times that of copper and 17.5 metres of this wire was measured to have a resistance of one ohm. I decided to start with one ohm so that the load current would initially be 13.8 amps. I was a little dubious about putting the full load on the supply until I had first had a look at temperature rise in the heat sinks at the lower power.

To check the value of wire resistance, a digital multimeter was used. This gives a more precise reading than an analogue meter, although the latter could be used if read with care.In any case it is advisable to check the calibration of the instrument against several one ohm resistors which can normally be obtained from most electronic stores. Modern resistors can be relied upon to be very accurate (if operated well below their rated power). In measuring resistance the test leads were clamped tightly to the galvanized wire so that the joint did not add appreciable resistance error. Earth jointing connectors, used in power wiring, were put to good use for this purpose.

The galvanized iron wire was wound on a frame made from two 133 cm lengths of wood crossed at right angles (See Fig 1). Holes were drilled in each leg of the frame at various intervals and the wire was wound in a spiral through these holes until the wire ran out.

Mounting the wire test load on a frame made it more convenient to use adjacent to the test bench. I had considered running the wire down the back yard and back again or fitted to the back fence. There is nothing wrong with doing something like that, but I decided that it might be a nuisance if I needed to use the load for extended periods.

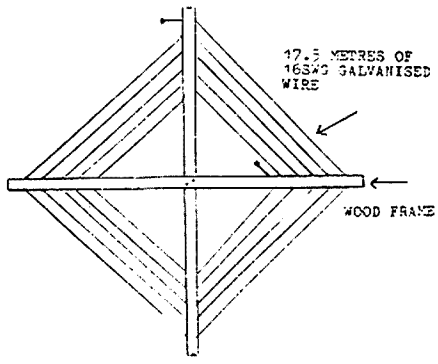


Figure 1 Test Load — 16 SWG wire wound on wood frames. 17.5 metres gives around 1 ohm. This can be tapped back to 0.7 ohm.

To connect the test load to the power supply, heavy copper wire leads were used so that negligible resistance was added by the connection. Of course the power connectors were again needed. For full load, the wire was ultimately tapped down to 0.7 ohm as measured at the end of the leads connecting to the power supply terminals. By measuring there, any connection resistance is included anyway.

At full load current of 20 amps, the dissipation in the wire is about 20 watts per metre (or .22 watts per cm) and the wire is just mildly warm. Of course a low temperature rise on load is important. Based on the temperature coefficient for soft iron, a rise in temperature of as much as 20 degrees centigrade would increase the resistance by 12%. The power supply worked out fine once I had corrected an instability fault which initially showed up at full load. Without the test load, the fault would not have been detected. Regulation was measured as 0.35% which I considered acceptable. The galvanized wire had done its job. Perhaps someone else needs to test a supply and can make use of this cheap and simple idea.

References:

1. Denzil Roden VK2BXF — "The Even Simpler Regulator" — Amateur Radio, January 1980.
2. Des Greenham VK3CO — "13.8 V Regulated Power Supply" — Amateur Radio, May 1983.

ar

The DSE Commander Mark 1 "Thoughts and Experiences"

Dave Kant VK2BJI
PO Box 564
Parkes NSW 2870

Introduction

OVER THE PAST FEW years I have had a number of radio contacts via the local two-metre repeaters regarding people's problems in getting their Commander radios operational. The latest QSO was with Mike VK3ATB whose problems seemed to be similar to those that I had encountered. Evidently there was an emerging pattern of consistently occurring problem areas in this radio. I felt the experience that I had gained while finding solutions to the problems in my own set, and others that I had worked on could benefit other operators. I suspect there are DSE Commanders out there collecting dust which could well be fixed by using the additional information I have gathered.

In central west New South Wales a lot of interest has been shown in building this popular DSE kit. The earlier versions — Version 3, for instance — of these radios have worked better than the later versions — Version 6. If constructors had taken their time and followed the construction details methodically, fewer problems were experienced. However, final alignment was generally troublesome and I advise constructors who do not have access to basic test gear such as a CRO, frequency counter etc, to seek out somebody who is adequately equipped.

Walter Field VK2NNF decided on a bulk purchase of the kits for the local radio club provided I would carry out the alignment on any sets constructed. As things turned out, some kits showed a severe design fault, the solution to which removed any tendency of the same problem occurring in others. The modifications are numerous, but I believe they offer a worthwhile improvement to the performance of the radio. The aim of these modifications is to achieve a result which is stable and predictable.

All of the following modifications were applied to at least three radios to verify the results.

Modifications

The Rx audio amp suffered various instabilities ranging from motorboating to added hiss. If your radio is an early kit (Q11 is BC337 and Q12 is BC327) then you may not have experienced this problem. The later kits substituted BC639 for Q11 and BC640 for Q12. A stabilising network consisting of a capacitor and resistor in series is usually connected to the output of IC audio amps. Adding a series network of a 47 nF capacitor and a 2.7 ohm resistor connected to the output of the audio amp is useful in eliminating troublesome supersonic oscillations. The component values are not critical in this application, but be sure to keep the leads reasonably short. I connected this network underneath the PCB from the junction of R47, R48 to ground.

The Tx audio had been noticed to be somewhat thin, with a lack of the lower frequencies below 1000 Hz, as well as exhibiting overall general distortion. I altered the Tx audio frequency response to be 6 dB down at 300 Hz by changing C57 from 2.2 nF to a 5.6 nF greencap. The main cause of the audio distortion is severe peak clipping in the audio clipper. The problem may be caused by the supplied Carol microphone having a higher sensitivity than originally intended, or else by my habit of talking more loudly into the microphone than is really necessary. A 1 KΩ resistor in series with the microphone signal wire will reduce the microphone sensitivity and loading. The feedback pair mic amp has a low input impedance. Also a bias error was causing negative clipping before the audio clipper. If you change R53 from 560 to 680 ohms, the collector of Q14 will go from 2.5 to 4V DC, and this clipping will not occur.

The heatsink of the Tx Driver Q21 runs very hot — MUCH TOO HOT! Paul Bell VK1BX suggested this situation arises from excessive drive as indicated by high collector current. The collector current of Q21 is high and sometimes it exceeds the manufacturer's maximum value of 400 mA. I have had one case of a blown driver, and another where the pcb was badly scorched. The easiest way to reduce the drive is by removing C88. This will result in a more reasonable current of 250 mA and a cooler heatsink. After reducing the drive, the power output is now low, but it can be restored by making the following changes: Rewind L23 onto a 17/64" drill bit and L26 onto a 13/32" drill bit using the same wire type and the number of turns as specified with the original kit. The change in size of L23 will result in a better match between the driver and the PA stage. Altering the size of L26 causes a change in output power, so I tried variations in coil size until maximum output power was achieved. Replace RFC5 and RFC6 with chokes similar to RFC3 and you will pick up one watt in each case. Later kits have added L31

and C175 to reduce Tx harmonics. I found the extra filtering was causing a loss of two watts of output power. I didn't determine if the filter was too low in frequency or if L31 has wire which is too thin for the job. Try L31 with thicker wire, but avoid using tinned copper wire. Enamelled copper wire has lower losses in RF circuits (the enamel keeps the wire surface shiny) and is nearly as good as silver-plated wire. In my situation in the bush I returned to the original early kits and left out L31 and C157.

After a few years of use, my Commander's voltage regulator Q1, Q2 would not turn on. It relies on a leakage path created by R1. This is a sloppy start-up circuit. A sure-fire circuit can be incorporated by connecting a series combination of a 4.7 K and 1 K resistor from the emitter of Q1 to ground. From the junction of the added resistors a diode (1N4148) goes to the base of Q2 with the cathode end towards the base. Remove R1 from the circuit.

The most difficult problem I encountered was in a radio owned by George VK2GAW. The carrier was okay, but in use as the Tx stages warmed up an additional modulation would occur which ranged from geiger counter like clicks to a severe roar which would mask the voice modulation. I have seen other radios with this problem to a lesser extent which only have the clicking symptom. The effect is more severe if the antenna has an SWR mismatch. I stumbled across the fact that a 10:1 CRO probe connected to most places on the radio circuitry would show up a 20 MHz trace on the CRO. The phantom oscillation would drop out if L9 was detuned, giving little output power with this situation. This discovery clearly demonstrated the problem. Cutting the wire link between L29 and C126 (the Rx input from the LPF) made the Tx stable. Altering the input tap on the L2 tuned circuit by altering the ratio of C123/C124 also had the same effect. The fix is common to both transmit and Rx RF amp instabilities.

Another major problem can be a tendency for the Rx RF Amp (Q6) to readily break into oscillation. I initially lived with this problem by slightly detuning the coils around the RF amp, but while investigating the above TX instability I was forced to modify the tuning capacitors across L2. This renders the Rx RF amplifier totally unstable because of the higher circuit gain by reducing the damping on L6 and the subsequent Q increase of the tuned circuit. A new RX RF amp retaining the BFY90 transistor was designed, which still maintains the original RX sensitivity and adds improved front end selectivity. The details of this new Rx RF amp are as follows:

Remove R12, R13, R15, C13
Change C123 from 22pF to 6.8 pF
All of the following modifications are made to the underside of the PCB using physically small components and the shortest path:
Connect a 12 pF capacity across L2 primary.

Connect the emitter of Q6 to ground.

Connect a 100 K resistor between the collector and the base of Q6.

Connnect a 1 K resistor from collector of Q6 to the cold end of L3 primary.

Connect a 47 pF disc ceramic from collector of Q6 to ground.

Connect a 18 pF disc ceramic from the collector of Q6 to the hot end of L3 primary.

For lowest noise figure the collector current of Q6 has been set at 2 mA as indicated by a two-volt drop across the 1 K collector resistor. The circuit stability and selectivity are enhanced by tapping the antenna feed down the primary of L2 and tapping the collector of Q6 down the primary of L3. It should be noted that the ferrite bead on the emitter of Q6 is now not needed, but if convenient, can be left in circuit.

A useful added feature is to have a switched power of 1 or 10 watts. This is achieved by adding a resistor in series with the DC feed to the driver (Q21) and PA (Q22). The place I'm referring to is called "UNSWITCHED PA + 13V8" on the circuit diagram. Cut the relevant track on the pcb, install a 10 ohm 10 W resistor onto the back panel near the PA heatsink and install a C&K style miniature toggle switch on the back panel near the incoming dc wires. For 10 watts the resistor is shorted out by the switch, while for one watt output the resistor is in circuit.

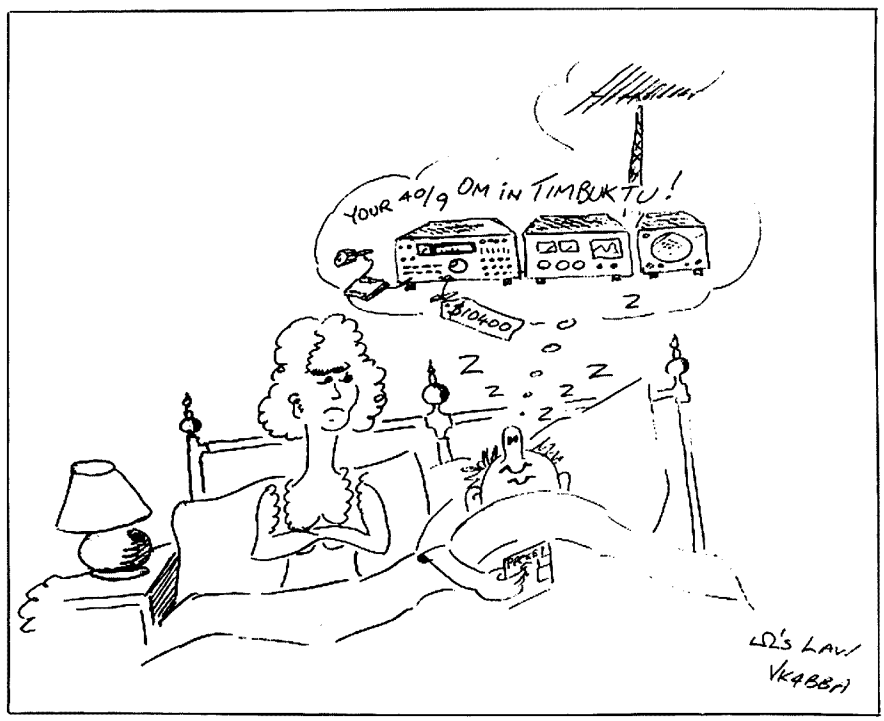
Conclusions

The modifications outlined will result in a radio which has Tx and Rx audio quality, which is excellent, especially with a larger speaker.

Acknowledgment to Peter VK2MLG for preparing this document.

Reference: Electronics Australia, June and July 1984.

ar



An Approach to Television Interference Control

Richard Cortis VK2XRC
4 Victory Street
Clovelly NSW 2031

Introduction

APART FROM THE basic and obvious technical matters, there are a great number of other matters which must be addressed before you can even contemplate a solution to the technical problems that may or may not exist. Your recognition of these problems and your initial approach to them may have a profound effect on your relationship with your neighbours for a very long period. The first thing to recognise is that a potentially serious conflict is already in existence when you are first made aware that your neighbours are suffering some form of interference. As each person and family is different, your reaction will have to be carefully considered and calculated.

Initial Contact

When you are first contacted by a neighbour and advised by him that he is suffering interference to his television reception, you must first determine whether or not the interference is caused by your station. In the first place, you should ask him or her the nature of the problem and under what circumstances it has been observed.

If it was apparent when you were away on holidays, it is unlikely to be your problem. He may not see it that way and may proceed to attack you absolutely mercilessly. Ask him to show you the problem. If it is there when you are not transmitting you may wish to bring this to his attention. But beware that not all members of the public are as well educated as you are, and to them the mere presence of all that electronic gear may be frightening to them. Also be aware that, from their point of view, their TV receiving system is second to none in existence and could not under any circumstances be at fault or wanting in any way. Ignorance and superstition begin to appear as your prime enemies.

You may find that the complaint relates to a general decline in the ability to receive all channels, poor reception on one or two channels or problems with ghosting etc. Have a good look at his TV antenna and feedline etc. Corrosion in contacts at connectors, splitters, amplifiers etc will significantly reduced his received signal and make his set more susceptible to interference from your and other stations. If his antenna is old or dilapidated you may consider drawing this to his attention. Bent and missing elements do little to improve reception.

On the other hand, you may find that the complaint may relate directly to interference from your station. Remember that you are already in a situation where a potentially seriously conflict exists. Remember that our society is becoming increasingly litigious and that once lawyers are involved it is most unlikely that normal relations can be restored. It would appear that some lawyers are not good at dispute resolution and may even have a vested interest in maintaining the conflict. Be ever so cautious in anything you say or do in order that you do not offend your neighbour or make any admission which could prove embarrassing to you in the future.

Initial Testing

Where it becomes necessary to carry out some tests, make sure that all your low-pass filters are installed and that your antennas are perfectly tuned. You do not under any circumstances want him to see anything that is in any way a temporary aberration of your station as he will want to believe that you do that all the time. Remember that he is not technically inclined and most probably does not understand the experimental nature of the hobby.

Where you suspect a particular band (like six metres) to be at fault you may consider making some preparations to attenuate the offending signal at his TV. If you run a test and your rig wipes his TV out completely, you may be able to save the day by having a filter or trap available to demonstrate (hopefully) that the problem is at least controllable. Remember the moment you cause any deviation from normal during a test you stand accused and you are seen as the sole cause of his interference to the complete exclusion of all other services. If you can fix it for him on the spot you may stand a good chance of parting as friends as the aim of the exercise is peaceful coexistence.

Should you find or suspect that your transmitter may in some way be at fault, you must cease operation immediately and not recommence until the fault has been completely rectified.

Interference Suppression

There are quite a number of possible causes of interference to television receiving systems. Should you find yourself confronted with a problem, it is suggested you seek information and guidance from others before you proceed to physical implementation of any proposed scheme. It is strongly recommended that you obtain a copy of the "Radio Frequency Interference Hand-

book" published by and available from the Department of Transport and Communications.

Start by reading it from cover to cover. Then re-read the more relevant sections. Your WIA Division will also attempt to help and may have a selection of designs for, and examples of, suppression devices which are both cheap and effective.

From the point of view of a first attempt solution, if the problem is suffered by a very close neighbour, the problem may be front-end overload of his receiver. The easiest solution may be the installation of an effective high pass filter. Should the problem be associated with only one band, the solution may lie in the installation of a trap on that frequency. The trap should be manufactured for the particular band or frequency in question and should be fitted with plugs so it can simply be plugged into the back of the TV and the antenna cable plugged into the trap. Nice and easy, and the complainant can be asked to plug it in himself.

If the high pass filter or band trap approach proves ineffective, you may find that a potentially more serious problem may be emerging. Be wary, you will require the detail and willing participation of your neighbour. If you cannot get his co-operation, you have a major problem, as you will need to delve further into his system. You will need the wisdom of Solomon and the patience of Job.

Some of the possible causes and some suggested solutions are set out below:

1) RF travelling down the outside of the TV antenna coaxial cable. Try winding the coaxial antenna cable around a piece of ferrite rod and taping it into position. Alternatively, the same coax may be wound onto a ferrite toroid. Both have the effect of choking out the radio frequency energy which may be travelling down the exterior of the cable. These methods do not attenuate the desired signal which is supposed to be travelling down the inside of the coax. Be careful not to kink the coax as this may change the impedance and attenuate the received signal.
2) RF radiated by your antenna may be collected by the street mains or by the house wiring in your neighbour's house, and may be entering his TV set along the power cord. Again try winding the power cable around a ferrite rod or through a ferrite toroid. If this is not successful or produces only limited suppression of the problem, you should consider a commercial mains power filter. These are becoming readily available, and are not expensive. They are usually used in conjunction with a home computer.
3) RF picked up by the inner circuitry of the TV set. You have a problem. The chances are that your neighbour is not going to let you line the innards of his pride and joy with aluminium foil, and if he did, it may not work anyway. The real solution is to stop radiating into his TV. Try moving your antenna or redirecting the major lobe away from his TV set. The most satisfactory solution is to upgrade your antenna system and stick it up on a tower well above the susceptible TV, and possibly well above his antenna, too. There is not much else you can do.

Who is Going to Pay for all This?

The question of who is going to pay for all of this is a moot point. Theoretically, each person is responsible for the rectification or modification of his own equipment. However, you must remember that you are officially at war (either declared or undeclared) with your neighbour, and there may be some sacrifices to be made in the interests of a lasting peace. On the other hand, you must be aware that some precedents may be established that you would rather not establish. In order that you get back on air, it may be expedient to purchase the equipment and install it at your own cost. That may be okay for one house, but may become totally unacceptable for the whole street. An option may be to lend the gear to the neighbour pending his later upgrading of the system when next he has some work done. Then you can forget to ask for it back. If anyone else wants it done, they can look at what you have lent to the first neighbour and go and get the gear out. But then again, if they become a real pain, the cost may be justified just to stay on the air peacefully. Again, you need the wisdom of Solomon.

Running Warfare

When early attempts to achieve a workable solution fail and you find yourself in a running battle with one or more of your neighbours, it will be necessary to enlist the assistance of a technically skilled mediator. This usually means that you somehow get the neighbour to pay the fee and lodge a complaint with the Department of Communications. This means dealing with a radio inspector. This can actually be quite a lot of fun if you have not played with a spectrum analyser before. If you are properly prepared, you can probably get the assistance of the RI and his spectrum analyser to trim coaxial traps and to tune some filters. You can also have a look at the characteristics of some of the interference suppression devices you intend to use. Don't be backward in asking, as the things you are asking are part of the overall solution to the problem. It also demonstrates most effectively your good intent in the solution of the problem. Get into it.

Another aspect of calling in the Radio Inspector is that it is human nature not to place a lot of value on something that is free. Your neighbour, having paid a nominal fee for the attendance of the RI, will possibly be in a better frame of mind to listen to him and to take the advice that he has paid for. Try it, but make sure your TV does not suffer interference under full power conditions and that your station is in generally top class condition.

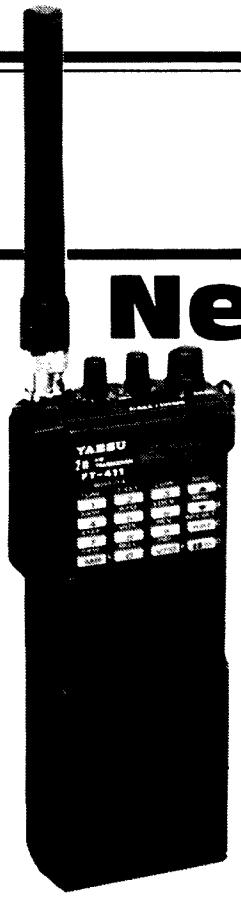
Conclusion

The resolution of complaints about amateur radio interference with the reception of television programs is quite difficult, as it impinges upon the passive recreation of a person or family who feel they have done nothing wrong as the problem did not arise until you came along. If the problem goes away when you go away, it MUST be your fault ! The technical matters are reasonably well documented. However, you will need to call upon the pinnacle of public relations expertise in order to resolve the average problem.

ar

DICK SMITH ELECTRONICS

New Year Clearance Specials



FT-411E 2m DELUXE HAND HELD

Proven performance, ease of use and great value for money have been the hallmarks of the FT-411e 2m handheld for mony years now. But with new models coming soon, we're clearing our stocks of new and ex-demo FT-411Es to make room for the new arrivals. So rush in and pick up a bargain, while stocks last!

- 144 to 148MHz transceive operation, with enhanced receiver performance
- Ultra long life 1000mAH 7.2V NiCad battery pack (supplied as standard!)
- 2.5 watts RF output as standard, 5 watts with 12V DC (or optional FNB-11 NiCad)
- Better than 0.16uV (12dB SINAD) sensitivity
- Programmable power saver (stand-by current only 7mA with 1 sec save)
- Keypad or dial frequency entry, with selectable tuning steps
- 49 tuneable memories which store repeater offsets
- Band, memory, priority or limited-band scanning
- Just 55 x 155 x 32mm
- Carry case, belt clip, carry strap and approved AC charger
- Now with enhanced receiver sensitivity and improved strong signal handling!

Cat D-3350

2 Year Warranty **$449**

Save $30 (Even less for ex-demo units)

FT-650 6m,10m,12m 100W TRANSCEIVER

Now's the time to enjoy the summer DX season on the 6m and 10m bands, and the Yaesu FT-650 mobile transceiver allows you to do it in style. It's all-mode operation, 100W RF output (SSB, FM, CW), and continuous 24.5 to 56MHz receiver coverage allows you to hear signals outside the Amateur bands, so you can track the rising M.U.F and work stations as soon as the band opens. The use of 3 D.D.S.'s and a 2-stage low noise RF pre-amp results in a very quiet and sensitive receiver (SSB/CW, 0.125uV) so you'll hear weak signals much more easily. To cater for the FM enthusiast, the FT-650 provides repeater offsets, an FM narrow mode as well as exceptional 0.16uV (12dB SINAD) sensitivity. Other features include selectable tuning steps, manual/auto IF notch filter, RF speech processor, IF shift control, 105 scannable memories and an effective noise blanker. Includes MH-1 hand microphone.

Cat D-3250

2 Year Warranty

Now Only **$1995**

AC version FT-990 Cat D-3260 **$3495**

DC version FT-990 (upgradeable to AC version) Cat D-3255 **$3195**

FT-990 H.F ALL-MODE TRANSCEIVER

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a very wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM) with the internal AC power supply allowing high duty cycle transmissions. An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 500Hz B/W CW filter, 90 memories and one-touch band selection. Microphone optional extra.

2 Year Warranty

B1440

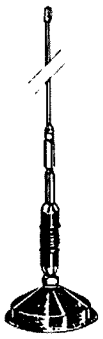
YOUR ANTENNA SUPERMARKET

We carry a wide range of antennas and accessories.
Here are just a few...

HUSTLER RX-2 2m 5/8 WAVE MOBILE

Here's value! A quality American 2m 5/8 wave magnetic mount antenna for mobile or temporary base station use. Comes complete with 4.5m of coax cable with a PL259 attached. It provides 3dB gain with a power rating of 100W maximum, and uses a flexible stainless steel whip to minimise wind loading.

Cat D-4805 **$49.95**



HUSTLER 1/4 WAVE MAGNETIC ANTENNA

HUSTLER

A great idea for extending the range of handheld transceivers! The Hustler UGM is a compact 1/4 wave magnetic mount mobile antenna supplied with 2.1m of mini coax fitted with a BNC plug. Simply use the supplied frequency chart to cut the flexible stainless steel whip to the required length for your application (within the 140-500MHz range) and it's ready to use.

Cat D-4802 **$39.95**

DUALBAND MOBILE ANTENNAS

Our exclusive range of Brainer 2m/70cm antennas provide excellent performance at a reasonable price. They feature quality Japanese construction and come complete with detailed, locally written instruction sheets so you can get the best from your mobile station.

a) TM-723m MAGNETIC 2m/70cm ANTENNA

The TM-723m is a compact, slimline dualband mobile antenna ideally suited to vehicles where a permanent mounting position is not available (eg. a company car). While just 0.7m long, the TM-723m provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a maximum power rating of 50W (conservative). Supplied complete with low loss coax cable fitted with a moulded PL-259 plug.

$99.95 *New for '93*

Cat D-4812

BRAINER

b) ST-7500 2m/70cm ANTENNA

The ST-7500 is a compact, medium gain dualband antenna that provides good performance when gutter or roof mounted. It's just 1m long, provides 3dB gain on 2m and 5.5dB gain on 70cm and has a maximum power rating of 150W. A quality tapered stainless steel whip element and an inbuilt tilt-over mechanism make the ST-7500 ideal for use on vehicles that often have to enter garages or carparks. Requires an SO-239 antenna base (D-4035 or D-4052 recommended), or SO-239 magnetic mount (D-4520).

BRAINER **$79.95**

Cat D-4810

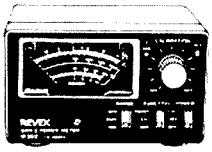
c) ST-7800 DELUXE 2m/70cm ANTENNA

Our best dualband mobile antenna! The ST-7800 is ideal for long range mobile operation, providing high gain (4.5dB on 2m, 7.2dB on 70cm) from its 1.5m length. Like the ST-7500, it incorporates an inbuilt tilt-over mechanism to allow laying the antenna over when entering carparks, and it can either be gutter or roof-mounted with good results. With its high gain and 150W power rating the ST-7800 can also be used successfully as a temporary base station antenna. Requires an SO-239 antenna base (D-4035 or D-4052 recommended).

BRAINER Cat D-4815 **$129.95**

New for '93

REVEX SWR/ PWR METERS



Revex meters feature quality Japanese construction, large meter movements and low-loss wideband SWR/PWR sensors. We carry 2 of their popular models, the W502 and the W540, each of which provide 3 power reading scales plus SWR measurement, but with differing frequency coverage.

W502 HF/6M METER

Covers 1.8 - 60MHz and has an accurate P.E.P metering circuit. As well, it has 20W, 200W and 2kW scales and a backlit meter. Requires 13.8V DC.

Cat D-1360 **$239**

W540 VHF/UHF METER

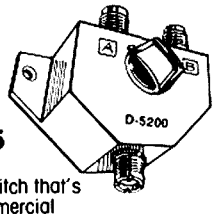
Covers 140 - 525MHz and has an average-reading metering circuit. It has 4W, 20W and 200W scales. Requires no DC power.

Cat D-1370 **$199**

Great Price!

2 POSITION COAX SWITCH

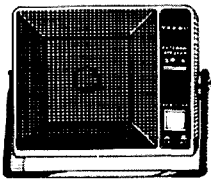
Cat D-5200 **$39.95**



A heavy duty, 2 way coax switch that's suitable for Amateur, or commercial applications. It's well constructed with a die-cast case and can handle up to 2kw PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.

YAESU SP-4 EXTENSION SPEAKER

$39.95

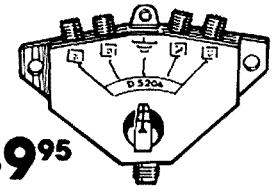


This quality speaker has a built-in switchable noise filter and comes with a swing mounting bracket. It handles 3W at 8 ohms and looks smart alongside any RF rig. Comes complete with lead and 3.5mm mono plug.

Cat D-2300

With Surge Protection

4-WAY COAX SWITCH



$89.95

A high quality 4-way coax switch featuring rugged die-cast aluminium construction, 2kW P.E.P. (max.) power handling at 30MHz, and only 0.3dB insertion loss. It has an in-built surge suppressor and automatic grounding of all un-used connections..... in conjunction with a 'ground' position on the switch, it helps protect against lightning induced surge damage.

Cat D-5204

RUGGED HF 5-BAND TRAP VERTICAL ANTENNA

HUSTLER

The tradition continues! The 5BTV is yet another masterpiece from the people who have been making antennas for over 33 years. This rugged 5 band HF trap vertical uses Hustler's exclusive trap design (25mm solid fibreglass formers, high-tolerance trap covers and low loss windings), for accurate trap resonance with 1kw(PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, less than 2:1 SWR at band edges), with 80kHz bandwidth typical on 80m at less then 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands.

High strength aluminium tubing and a 4mm (wall thickness) extra heavy-duty base section provides optimum mechanical stability. What's more, stainless steel clamps and hardware guarantee a longer lite. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs the 5BTV can be fed with any length of 50 ohm coax cable.

Cat D-4920

Hurry, last chance at the old price! **$299**

Made in USA

30m RESONATOR KIT

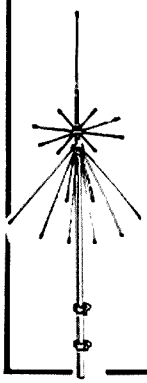
Adds 30m coverage and includes all hardware.

Cat D-4921 **$89.95**

VRK-1 RADIAL KIT

Provides a 5-band ground-plane for above ground antenna mounting positions.

Cat D-4922 **$69.95**



DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz and is easy to assemble and install. With extensive aluminium and stainless steel construction it's extremely durable, while allowing transmission on the 6m, 2m, 70cm and 23cm bands with a maximum power rating of 200W PEP. Complete with mast mounting hardware, stainless steel U-bolts and instructions.

Cat D-4840 **$169**

VHF/UHF BASE STATION ANTENNAS

We carry a wide selection of high quality vertically polarised base station antennas to suit most VHF/UHF Amateur applications. Each antenna was chosen based on its tested performance, reliability, construction quality and value for money, so you can be confident they'll work well the first time and last for years. Brands supported include Diamond and Brainer from Japan, as well as an excellent Australian made Mobile One product.

a) HIGH PERFORMANCE VHF/UHF BASE STATION ANTENNAS

These antennas from Diamond and Brainer are all of a stacked colinear type which provide high gain, wide bandwidth and a low radiation angle for extended range base station operation. Each antenna uses a jointed F.R.P (fibreglass reinforced polyester) outer tubing radome with gasket seals to ensure excellent all weather operation, and is supplied with compact ground-plane radials for a clean radiation pattern. Corrosion resistant stainless steel mounting hardware is also supplied. Brainer antennas are exclusive to Dick Smith Electronics and feature detailed locally written instruction sheets. Both brands are covered by a 1 year warranty.

2m ANTENNA F-23A

Frequency: 144-148MHz
Gain: 7.8dB
Max Power: 200W
Length: 4.53m
Type: 3 x 5/8 λ colinear
Connector: SO-239
Cat D-4850

DIAMOND **$239**

2m/70cm ANTENNA GST-1

Frequency: 144-148MHz, 430-440MHz
Gain: 6.0dB(2m), 8.0dB (70cm)
Max Pwr: 200W
Length: 2.6m
Type: 2 x 5/8 λ colinear (2m), 4 x 5/8 λ colinear (70cm)
Cat D-4830

BRAINER **$199**

23cm ANTENNA F-1230A

Frequency: 1260-1300MHz
Gain: 13.5dBi
Max Power: 100W
Length: 3.06m
Type: 25 x 1/2 λ colinear
Connector: N-type
Cat D-4870 **$299**

2m/70cm ANTENNA GST-3

Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB (2m), 11.7dB (70cm)
Max Power: 200W
Length: 4.4m
Type: 3 x 5/8 λ colinear (2m), 7 x 5/8 λ colinear (70cm)
Connector: SO-239
Cat D-4835

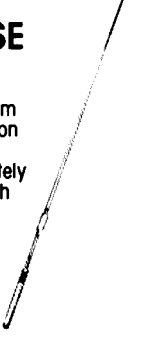
BRAINER **$279**

b) ECONOMY 2m BASE STATION ANTENNA

An outstanding value-for-money, compact 1/2 wave Australian-made 2m base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection.

Cat D-4820 **5 Year Warranty** **$49.95**

MOBILE ONE



DS XPRESS PHONE & MAILORDER SERVICE
Outside Sydney (FREE Call) 008 22 6610 Sydney And Enquiries - (02) 888 2105
FAX: (02) 805 1986 or write to DS XPRESS, PO BOX 321 N/RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.

DICK SMITH ELECTRONICS

STORE LOCATIONS:
NSW • Albury 21 8399 • Bankstown Square 707 4888 • New Store Location - Blacktown Shop 301, 22-24 Patrick St 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 28 0238 • Hornsby 477 6633 • Hurstville 580 8622 • Kotara 58 2002 • Liverpool 600 6666 • Maitland 33 7899 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3666 • North Sydney (Greenwood Plaza) 964 6467 • Orange 616 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 6111 • Tamworth 66 1711 • Wollongong 29 3800 **ACT** • Belconnen (06) 253 1788 • Fyshwick 280 4944 **VIC** • Ballerat 31 5433 • Bendigo 43 0388 • Box Hill 890 6666 • Coburg 383 4455 • Dandenong 794 8377 • East Brighton 592 2388 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 6144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 328 6088 & 248 Bourke St 639 0888 • Richmond 428 1614 • Ringwood 878 8338 • Springvale 547 0822 **QLD** • Booval 282 8200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 248 2870 • Chermside 359 8255 • Maroochydore 791 800 • Rockhampton 27 9844 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 • **SA** • Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6066 • St. Marys 277 6077 **WA** • Cannington 451 8666 • Fremantle 336 6733 • Perth City 481 3281 • Midland 250 1460 • Northbridge 328 6844 **TAS** • Hobart 31 0800 • Launceston 344 558 **NT** • Stuart Park 81 1877 **STORES ACROSS AUSTRALIA AND NEW ZEALAND**

B 1440

Right to the Source!

The Ultimate Way of Ridding the Bands of Intruders

Norm Schroeder VK6NS

SOMETIME BACK I was on 20 metres, and to my astonishment heard music on 14.150 at 5-9 plus 20 dB over! To make matters worse (for me anyway) it was coming from Vienna, where my parents come from and where I went to school. What could I do? It had become a personal thing now!

After some thought, it came to me. As I speak fluent Austrian, I will phone them!

The overseas directory gave me the number very quickly. I asked to be put through to the transmitter supervisor, got him first hit. I said I was speaking from Perth, Western Australia, and that his transmitter was well within our ham band frequency. He said that could not be (but, I could hear him tuning to 14.150 on a Rx somewhere near) and lo and behold, there it was, right where I said!

After profuse apologies he promised to take the offending transmission out of our band!

Three minutes later — it was gone!

More About Norm VK6NS

Born in London in 1922 of Austrian parents; spent half his schooling in Vienna; till 1929, got out of Vienna three days before war broke out, just. But that's another story!

Joined the British Army in 1941 (a bit awkward that, as he has a typical German name!) and spent the next four years overseas, starting off in the North African desert force. Slowly wound his way up Italy and crossed the southern border of Austria the day war finished. Was given special permission to be on the first convoy into Vienna, to see if his parents were still alive!

Found them well, but starving. Out of all his relatives, of which there were many, only one uncle died on the Russian front.

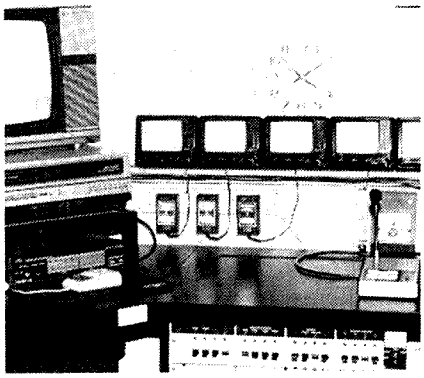
After arranging some basic sustenance for his mother and father via the British Red Cross, he was given permission to fly them to London to their married daughter. He then set out on his first of four migrations. First to Canada; gave up after one year, having an assortment of jobs, such as lumberjack in the northern territories, truck-driver, gas pump attendant etc.

Second migration was to South Africa (Jo-Burg); lasted only six months there. His third migration took him to southern Rhodesia, more truck driving! This time 20-ton 32-wheel low-loaders taking Caterpillar D9s to start off the now famous KARIBA DAM.

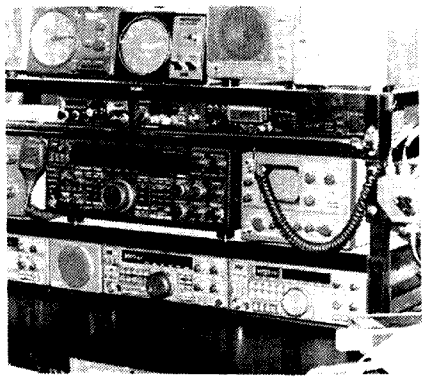
When all the heavy plant items were delivered he was offered the job of Site Stores Controller by the contractors, where he first came face to face with two-way radio, a direct link to the-then capital, Salisbury, some 1000 miles to the south of the Zambesi River. At night, when things were quiet, he listened to hams on the two-way, which had short-wave facility built in, and caught the bug! So, on the next four-day leave (once a month) he went to the Post and Telegraph Office in Salisbury and calmly asked for one of them [sic] "ham" licences! Boy, was he in shock when it was explained, in detail, what a ham licence entailed. Undaunted, he armed himself with the appropriate books and previous test papers and took off back to the Kariba dam site. Months later, and with the help of the resident post-office engineer, he decided (with great trepidation) to take his test, which he managed to pass, and received the call ZE5JI. Date: 1959.

After the completion of the Kariba Dam he joined the staff of RTV (Rhodesia TV Service) and helped to put the station on air, being the first in southern Africa. then his former employer from the Kariba dam days sent him to Nigeria to install two-way radios in their building projects north of Lagos (another good story). First stop to the DoC! You guessed it — pick up that rare callsign — 5N2NFS! So he got his full initials. Norman Francis Schroeder! Not difficult, as at that time

Norm VK6NS himself, now 70 years old.



An interesting corner in Norm's shack. Note Pakratt, Computer, and five little TV monitors!



Close up of the rack. The hand rail (centre) is actually a home made fluoro light.

there were only six amateurs there! Date: 1961. By this time he had married Helene (now VK6HI) a year previously, and they had a son whilst there, Mark (now VK6NFS). Now we come to the fourth migration — Australia!

But before we tell this incredible life and jobs here (AND the fear of boring you good people to death), we will terminate this saga and ask you to look at the accompanying photos of his present-day shack.

ar

VHF — UHF Field Day 1993 — Rules

The Field Day will again be run over the last weekend of the Ross Hull Contest — January 16/17, 1993. The locator based scoring has been retained in the hope of increasing interest in "grid collecting" for the WIA Grid Square Award. Times in the eastern states will be the same as last year, but for VK6 stations the Field Day will begin and end three hours later.

I hope this new timing will encourage more VK6 stations to participate, as the times will now correspond more closely to local time.

This time change will mean that for the first three hours of the Field Day it will be possible for a station in the east to score from a VK6 contact, but the VK6 station could not. However the same will occur in reverse at the end of the Field Day, so the effects should even out.

Field Day contacts can be counted for the Ross Hull Contest, and vice versa. Serial numbers do not have to be consecutive so there is no need to exchange two sets of numbers. The only points to remember are:

— You may score repeat contacts for the Field Day, but each station may only appear in your Ross Hull log once per band per day.
— Field Day exchanges must include Maidenhead locators.

The other main change is the introduction of a six-hour period as well as the normal 24-hour section. This will make it easier for those who can only go out for one day.

Duration

VK6 only: 0500 UTC Saturday 16 January to 0500 UTC Sunday 17 January.

All other call areas: 0200 UTC Saturday to 0200 UTC Sunday.

Sections

A: Portable station, single operator, 24 hours.
B: Portable station, single operator, 6 hours.
C: Portable station, multiple operator, 24 hours.
D: Home station.

Single operator stations may enter for both Section A and Section B.

General Rules

All modes and bands above 30 MHz may be used. Contest exchanges should not be made on recognised DX calling frequencies. Repeater and crossband contacts are not allowed. Entrants may not operate from more than one locator square. You may work stations within your own locator square.

Contest Exchange

RS or RST reports, a three-digit serial number (serial numbers need not be consecutive), and your Maidenhead locator.

Repeat Contacts

Stations may be worked again on each band after four hours.

Scoring

1 point per contact, 2 points if both stations are portable. Band multipliers:

6 m	2 m	70 cm	23 cm	2.3 GHz	Higher
x 1	x 4	x 7	x 10	x 13	x 16

For each band, multiply the points score (either 1 or 2 points per contact) by the number of locator squares worked on that band, then by the appropriate band multiplier. For example, on 2 metres, 20 points x 4 squares x 4 = 320 points.

See the same scoring table below.

Logs

For each contact: UTC time, band, station worked, serial numbers and locator numbers exchanged, points claimed. The front sheet should contain the name, address and callsign of the operator, section entered, and a scoring table as follows:

Band	Points		Squares		Multiplier	Total
6 m	xxxx	x	xxxx	x	1 =	xxxx
2 m	xxxx	x	xxxx	x	4 =	xxxx
70 cm	xxxx	x	xxxx	x	7 =	xxxx
etc.						
Overall Total						xxxx

Entries

Post logs to the Manager, VHF-UHF Field Day, PO Box 300, Caulfield South, Vic 3162. Logs must be received by Monday, February 1, 1992. Early logs would be appreciated.

Awards

The overall winner will be the highest all-band scorer in Section A. Awards will also be made to the highest scorer on each band in Section A, and the highest scorers in Sections B, C and D.

ar

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

AsiaNet IBM Library

Les Kinch VK2BBD
Longford
Bendemeer NSW 2355

I NOTED IN THE March issue you gave publicity to the very worthwhile Commodore library that operates from Fremantle WA. I am in fairly frequent contact with John VK6YBP as we exchange notes on the most efficient way of running these disk-based libraries.

In 1988 I established an IBM library — usually called the AsiaNet IBM Library, and have concentrated on issuing packet bulletins from time to time to let those interested know just what new stuff I have received. The response has always been very good.

These lists are usually retained on many of the Packet BBSs for access by local users — all over the world. I have yet to hear of a similar library anywhere — so I guess I must be "IT"!. Customers have been from as far away as Norway, Sweden, Germany, England, Cyprus, Greece, Hongkong, Taiwan, Ascension Island, Philippines, Hawaiian islands, NZ and all Australian states.

However, am I getting to the majority of Amateurs with these really super programs? — I think not. Not every amateur is a Packet radio buff, however I carry a heap of programs not necessarily involved with packet.

Editor's Note:

The programs are classified into a number of "libraries" entitled Comms, Ham, Utill and 2, Games. Regretfully, space pressures do not permit publication of a full listing in AR, but as a sample of what is available, the "Ham" library is reproduced here together with ordering information ... VK3UV. (Production Editor).

Library Ordering Information:

Disk size catered for: 3.5 inch 720/1.44 — cost $5.00 each disk.

5.25 inch 360k/1.2MB — cost $3.50 each disk.

Disk prices INCLUDE disks, packaging,postage and DOC(if needed) ALL docs are on disk for local printout.....

Overseas Orders: Prices are in US$, except for NZ customers who may forward Australian Dollars.

ALL programs are COMPRESSED to save space. Most are compressed using PKZIP or LHARC. Some are self-extracting files as used by the originator. In any case the sizes you see on the various lists are those you should consider when you make up your program order.

When making up your order for the Library, consider these points:

1. Disks can contain 360K, 720K, 1.4MB or 1.2Mb — depending on your preference.
2. If you have programs totalling 375K for sending on a 360K disk that will use TWO disks — whichever way you juggle it. Better to find some more programs to fill the disks usefully — I don't mind. The same rules apply to ALL sizes of disks.
3. Having seen the Library lists, If you have FREEWARE/SHAREWARE programs which you think would be useful additions to this library, please feel free to send them on to me. I will offer you free choice of the library for such donations — this is the way the system improves.
4. Any suggestions for improving this Library format would be welcomed. It has been going since 1988 with little feedback but a lot of orders, so I am hoping it is OK as it is — still I am open to change.
5. If you don't have the "Un-Packing" programs — please say so on your order — you might order the latest version of "LHA" anyway as I shall be using that one more and more from now on.
6. New File-name Convention: A file name such as LHA212@.EXE or similar will always mean that it is self-extracting file and may well use a complete disk to extract the contained programs.
7. Interesting note; my disks contain a large amount of compressed programs. Shareware/Freeware disks usually contain just the ONE subject program.
8. If you leave enough room on the disk(s) you order I will always attempt to fill the disks up completely with the latest programs you may not have heard about. Now, that's value!

Order Address: Les Kinch VK2BBD, Longford, Bendemeer, NSW 2355.

ar

HAM PROGRAMS:

July 92

PROGRAM	SIZE(K)	BRIEF DESCRIPTION OF PROGRAM:
ALINCOMOD	53	COLLECTION OF "ALINCO'MODS
ARLOGD1	267	A COMPREHENSIVE LOG-BOOK PROGRAM
ARLOGD2	309	PART TWO OF ABOVE
ARLOGBK	286	LOG BOOK PROGRAM
AZDENMOD	4	SOME MODS FOR "AZDEN" RIGS
ANTPLOT	74	PRETTY COMPREHENSIVE ANTENNA-PLOTTING ROUTINE
BANDAID	122	A HAM "COMPANION"WORLD MAP. FOR XT ONLY IT SEEMS.
BAY-NEW	70	SOME LATER NOTES ON BAYCOM
C64MODS	5	SOME C64 COMPUTER MODS
CWTUTOR	131	CW TUTOR PROGRAM
CONLOG	98	CONTEST LOG PROGRAM

CONLOG20	134	CONTEST-LOG V20 FROM USA
COUNTIES	177	A LIST OF USA COUNTIES
CWTUTOR	98	SAYS IT ALL
CWWWLOG	150	CW W/W LOG KEEPING FROM USA
DAZCOM	70	A TERMINAL PROGRAM BY VK2DAZ
EA-PROJ	18	LISTING OF "EA MAGAZINE" PROJECTS
ELECTRON	86	MANY FORMULAE FOR ELECTRONICS
ETI-PROJ	15	LISTING OF "ETI" PROJECTS ..
FILTER	34	SOME FILTER IDEAS FOR YOU
FL2100MD	3	SOME MODS FOR FL2100 LINEAR
FTMODS	27	SOME MODS FOR YAESU "FT" SERIES
GREYLINE	78	DISPLAY WORLD-GLOBE/TIME ZONES FOR "DX" PATH
HAMCALC1	195	GETTING INTO THE "HEAVY FORMULA" STUFF 1
HAMCALC2	189	PART TWO OF THIS
HAMRTTY	142	A WORKING GUIDE TO RTTY — SOME SOFTWARE PROGRAMS
HAMSSTV	38	SOFTWARE APPROACH TO SSTV — WITH DIGITIZED PICS
HYPERLOG	220	COMPREHENSIVE HAM LOG-BOOK FROM USA
ICOMQSY	132	QSY PROGRAM FOR "ICOM" GEAR WITH APROPRIATE PCB'S
ICOMODS	190	SOME ICOM RADIO MODS
KDK2016	3	SOME MODS FOR THE KDK2016
KENWMODS	62	SOME MODS FOR KENWOOD "HF" GEAR
MORSE201	91	'SUPERMORSE" - THE BEST MORSE PROGRAM TO DATE.
MORSEDOS	17	HOW ABOUT MORSE RESPONSE FROM YOUR DOS ???
MOTROLA	306	MOTOROLA DATABASE OF IC'S (1 DISK, REALLY)
MOTROLA2	389	MOTROLA D/B LATER VERSION (NEEDS 720K DISK)
NACONLOG	180	NORTH-AMERICAN CONTEST LOG
OZSPLIT	24	SPLITS LONG FILES INTO APPROX 3K PACKETS FOR TX.
PCHAM	140	A CONTEST STYLE DATA-BASE..... NEEDS BASIC.
PROSCANM	15	SOME MODS FOR THE "PRO" SCANNERS
SATFIND	49	A REAL-TIME DISPLAY OF SATELLITES — GREAT PROGRAM.
SCANBATM	7	MODS FOR SCANNER BATTERY PACKS
TNCMODS	74	SOME MODS FOR TNCS
TOPLOG	1.2MB	MASSIVE LOG-BOOK PROGRAM FROM ITALY-VERY COMPREHENSIVE
VHF-UHF	50	UHF/VHF ANTENNA DESIGN
YAGIMAX	342	MAXIMIZE YOUR YAGI ARRAYS
YAGINEC	186	SMITH CHARTS/POLAR DIAGS AND THINGS
YAGIOPT	173	GOOD YAGI DESIGN PROGRAM
YASUMODS	32	YAESU MOD COLLECTION
WA9GFR	130	SMITH CHARTS-HF/VHF PROPAGATION CALCS.
WTIME	25	'WORLD-TIME" DISPLAY — ALL ZONES — GOOD ONE!
YAGIOPT	173	IF YOUR ARE "INTO" DESIGN — YOU NEED THIS ONE
CWTUTOR	95	MACHINE LANGUAGE MORSE PROGRAM — HONE-UP YOUR SPEED

ALARA

Robyn Gladwin VK3ENX

PO Box 438 Chelsea Vic 3196

I would like to extend my best wishes for the New Year to all. As communication technology truly makes the world a "global village", it is to be hoped that the radio friendships made by amateur operators can continue to foster understanding and tolerance between nations.

An interesting example of international cooperation through amateur radio is the experience of Joan Beevers, VK3BJB, who decided to learn some "Basic Japanese" six years ago. Joan was the VK contact and support person for YL Kyoko Imakiire, JJ6PPJ/MM, during her 187 day solo voyage around the world in the yacht, "Kairen". Kyoko left her home port of Kagoshima, Japan, on 12th October, 1991, and arrived back there safely on 15th July, 1992. Joan was also very busy supporting Kyoko's back-up crew via radio, phone, fax and phone patch. Joan was asked if she could be on standby to support the famous Japanese yachtsman/adventurer, Kennichi Horie, from 31st October, 1992, when he will attempt a Pacific crossing from Hawaii to Okinawa by foot-pedalling his new boat, "Mermaid". She was support station for him once before when he sailed from San Francisco to Japan.

The ALARA luncheons in VK5, VK3 and VK6, and the VK4 Net are proving popular as a means of both supporting YL amateurs and of encouraging others to join our hobby. VK2 has members spread all over the State but individuals like Dorothy Bishop, VK2DDB, are helping to attract new recruits by using the ALARA publicity kit now held by each State Representative. Dorothy set up a table at the recent annual Hornsby and District Amateur Radio Club (HADARC) exhibition at the Hornsby Hospital fete. This year she was kept busy answering questions from many interested ladies.

As 1993 begins, here is a reminder of the various YL Nets. This is an enjoyable activity for members and an excellent introduction to on air contacts for new operators.

Official ALARA Net: Mondays 3.580+-1030 UTC (or 1000UTC during daylight saving) VK6 ALARA/YL Net: Conducted by Poppy, VK6YF, following the national net on Mondays 3.585+- 1200 UTC.

YL "222" DX Net: Mondays 14.222 066 UTC. Call in from 0545 UTC. Net control: Dave, ZL1AMN.

European YL DX Net: Thursdays 14.243+ – 1700 UTC. Net control: Christine, GM4YMM.

VE/VK/ZL Net: Fridays 14.148 0500 UTC.

VK4 CQYL Net: Fridays 3.580+ – 0930 UTC.

YL Activity Day: 6th of each month. Listen on the hour and/or call "CQ YL". Frequencies — 14.288 21.188 28.588.

YL Chat: Bev, VK6DE, has a YL chat on Fridays 21.188 0400 UTC. **ar**

AMSAT Australia

Bill Magnusson VK3JT
359 Williamstown Rd Yarraville
VIC 3103 Packet: VK3JT@VK3BBS

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
Please take note of the AMSAT information nets:
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z depending on daylight saving and propagation . Check-ins commence 15 minutes prior to the bulletin.
Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).
Secondary 3.685 MHz. (Usually during winter).
Frequencies +/– 5 kHz for QRM.
AMSAT South West Pacific net:
2200z Saturday on 14.282 MHz.

Experienced satellite users and newcomers alike are welcome on the nets. A large body of experience is on hand to answer queries. Listen to the WIA divisional broadcasts for regular up to date AMSAT information.

AMSAT Australia newsletter and software service:
Satellite users whether experienced or newcomers will benefit by subscribing to the AMSAT Australia newsletter and soft-ware service. The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
PO Box 2141 Adelaide SA 5001

The newsletter provides up to date information on all current and planned amateur radio satellite activities. Graham also provides a first class soft-ware service for satellite users. New software is reviewed regularly in the newsletter.

Here we are at the start of 1993. What happened to 1992? This month's column will be devoted to a run down on the status of the currently operational amateur radio satellites. Last month I mentioned ZRO tests and their importance in an educational sense to help discourage thoughtless behaviour and emphasise the benefits of improving your station's listening performance. I will hold further discussion of this over until next month.

AO-10 (AMSAT Oscar-10). The first of the highly elliptical orbit amateur radio satellites. Oscar-10 is out of control due to radiation damage to the on board computer memory. It is permanently switched into mode B operation and switches itself off and on randomly depending to some extent on sun angle and state of battery charge. Oscar-10 is producing some excellent opportunities for long distance contacts but at times it requires a fair amount of power to access at long range. The attitude is unknown at present since no telemetry has been received for a number of years and further extrapolation is impossible.

UO-11 (UoSAT Oscar-11). The second in the University of Surrey (England) series. There are no transponders on this satellite. Its prime purpose is educational. It carries beacons and telemetry transmitters, and its signals are tracked by schools, colleges, and universities around the world. Full documentation is available to educational and amateur users from UoS. It continues to be fully operational and the controllers are always anxious to hear from new users.

FO-12 (Fuji Oscar-12). This satellite was fully operational when turned off some time ago. It always suffered from power budget problems and was subject to unscheduled mode changes.

AO-13 (AMSAT Oscar-13). Second and latest high altitude elliptical orbit amateur radio satellite. Fully operational and under complete control. AO-13 has spent much of its life with its apogees over the northern hemisphere but is moving slowly south and should provide some excellent operating this and next year. Projected demise is 1996, so get in there and use it while you can, and while conditions are good and improving.

UO-14 (UoSAT Oscar-14) Third in the UoS series. This satellite was switched from amateur radio use to commercial use some time after commissioning, and is currently in operational use by humanitarian relief organisations in Africa. All amateur radio operations formerly carried on via UO-14 are now carried via UO-22. Its future in amateur radio is unknown.

UO-15 (UoSAT Oscar-15). Contact was lost with this bird shortly after launch, efforts so far to recover control have been unsuccessful.

AO-16 (AMSAT Oscar-16) (Pacsat). Operating normally with BBS using raised cosine transponder. All functions operational.

DO-17 (AMSAT Oscar-17) (Dove). This satellite is rarely heard and is still causing problems for the control station. Efforts to upload new software are continuing. Maybe some good news in 1993?

WO-18 (Webersat Oscar-18). An educational satellite from Weber State College. Producing telemetry and pictures from an earth pointing CCD camera. Pictures so far have been of only fair quality compared to the UoSATs.

LO-19 (LUsat Oscar-19). Fully operational 9600 bps BBS taking quite a bit of load off UO-22.

FO-20 (Fuji Oscar-20). Full operational with A and D transponders alternating reliably. Good QSOs and an excellent 9600 bps BBS.

AO-21 (AMSAT-UA Oscar-21). Fully operational at present running 9 minutes of FM repeater and 1 minute of telemetry in each 10 minute time frame. Downlink signal is very strong but uplink appears to be difficult to access. Use 50 watts into an auto track circular polarised antenna for best results. This bird carries a lot of experimental gear so it could change operating modes at any time.

UO-22 (UoSAT Oscar-22). Best UoSAT so far. Fully operational 9600 bps BBS. Very busy, carrying loads of traffic. Heaps of telemetry etc. Probably represents the "cutting edge" of amateur radio satellite technology. This one will be a hard act to follow and no doubt future amateur radio satellites will carry clones of its hardware systems.

KO-23 (Kitsat Oscar-23). Korean copy of a UoSAT. Still under commissioning, working well with software uploads continuing. Hopefully its BBS will take some load from UO-22 when fully operational.

RS-10/11 and RS-12/13. Both going well but rather under used in this part of the world. Modes vary but mostly A and K. Long haul "over-the-horizon" contacts are possible with these birds. I will devote a column to them shortly to see if we can stir up some activity. They are popular in Europe where regular long haul contacts are made.

MIR (The Russian Space Station). Hardly an amateur radio satellite but regular amateur radio activity by each crew has made us come to regard it as one. The activity continues both on packet and voice. MIR is probably the easiest satellite to work. Just last night I had a QSO from my backyard using a handheld transceiver whilst watching them travel overhead in the dusk sky.

Welcome to 1993. It looks like being an exciting year for amateur radio satellites. Next month I will touch on ZRO tests and look at the amateur radio satellites currently under construction or planned for launch over the next year or two. **ar**

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 Ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	– 8
0.20	S1	– 14

The tables are generated by the GRAPH DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used to generate this month's predictions is 62. The predicted value for next month is 61.

Please note the return of the ten metre band and the slight change in format.

The change in format is part of an ongoing process of which more will be said next month.

ar

SHORT PATH

EASTERN AUSTRALIA

Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.9	-7	7.5	0	-8	-21	...	...
2	9.3	-16	7.2	-1	-8	-20	-39	...
3	12.6	-6	9.8	-2	-2	-7	-19	-34
4	19.0	3	14.6	-7	2	2	-1	-9
5	25.2	6	19.4	-12	2	6	6	3
6	26.9	8	20.5	-15	2	7	8	6
7	26.3	8	20.9	-14	2	7	9	7
8	25.6	9	20.8	-10	4	9	9	6
9	24.7	10	20.5	-4	8	11	10	6
10	23.7	13	19.1	6	14	14	11	6
11	22.6	16	18.1	17	20	18	13	6
12	21.6	20	17.3	26	25	20	13	5
13	21.1	23	16.8	33	28	22	14	4
14	20.5	24	16.2	36	30	23	13	2
15	19.8	25	16.0	37	29	22	11	0
16	18.7	26	14.6	37	28	19	8	-5
17	17.6	27	13.6	36	26	16	4	-10
18	16.4	28	12.6	34	23	13	-1	-17
19	15.5	29	11.8	32	20	9	-6	-23
20	15.8	28	12.0	32	20	9	-6	-23
21	15.4	24	11.4	27	15	4	-12	-31
22	13.6	20	10.5	19	9	-3	-20	-39
23	13.4	15	10.3	14	6	-4	-20	-39
24	12.1	6	9.2	7	-1	-11	-28	...

Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.8	7	10.4	6	5	0	-11	-24
2	14.8	4	11.3	3	4	0	-9	-21
3	14.8	0	11.2	-1	2	-1	-9	-20
4	17.0	1	12.8	-5	2	1	-3	-11
5	20.1	3	14.1	-8	2	3	0	-5
6	20.3	3	14.2	-10	1	3	1	-5
7	20.3	3	14.2	-10	1	3	1	-5
8	20.2	4	14.2	-8	2	4	1	-5
9	20.0	5	14.1	-5	4	5	1	-5
10	19.1	6	14.0	-1	6	5	0	-7
11	18.1	8	13.9	4	8	6	0	-10
12	17.1	10	13.7	8	9	5	-3	-13
13	16.4	13	13.0	13	11	5	-5	-17
14	15.7	17	12.4	18	13	5	-7	-21
15	15.1	22	11.9	24	15	4	-10	-26
16	14.4	26	11.2	26	14	2	-14	-32
17	13.7	28	10.6	26	13	0	-18	-39
18	13.2	29	10.1	26	11	-3	-23	...
19	13.0	30	9.7	26	10	-4	-24	...
20	13.6	29	9.3	27	12	-1	-20	...
21	13.0	24	8.9	21	8	-5	-24	...
22	12.6	18	8.7	16	5	-7	-25	...
23	12.6	12	8.7	12	3	-7	-24	...
24	13.3	9	9.3	9	4	-4	-18	-35

SOUTHERN AUSTRALIA

Mediterannean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.0	-3	7.7	1	-9	-22	...	...
2	9.4	-13	7.2	-1	-9	-22	...	...
3	13.0	-4	9.7	-1	-1	-7	-19	-33
4	19.9	4	15.4	-6	3	3	0	-7
5	23.3	6	19.2	-12	2	6	6	2
6	23.1	5	18.9	-15	0	5	5	2
7	23.0	5	18.7	-15	0	4	5	1
8	22.7	5	18.5	-13	1	5	5	1
9	22.4	6	18.2	-10	3	6	5	1
10	21.8	8	17.6	-3	7	8	6	1
11	20.8	11	16.7	6	12	11	6	0
12	19.7	16	15.8	17	17	14	6	-2
13	18.6	21	14.8	27	22	15	5	-6
14	17.8	24	14.1	31	23	15	3	-10
15	17.1	25	13.5	32	23	13	0	-14
16	16.5	27	13.0	33	22	11	-2	-18
17	15.8	28	12.3	32	20	9	-6	-24
18	15.0	28	11.6	31	18	5	-11	-29
19	14.4	29	11.0	29	15	2	-15	-35
20	14.2	29	10.7	29	14	1	-17	-37
21	14.9	27	11.1	29	17	4	-12	-30
22	15.6	22	11.7	25	14	3	-12	-30
23	14.5	17	10.9	18	9	-2	-17	-36
24	12.6	10	9.6	9	0	-10	-28	...

Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.7	12	10.9	12	10	4	-7	-20
2	15.9	10	12.0	8	8	3	-5	-17
3	18.3	9	14.0	5	9	7	0	-8
4	20.7	8	14.8	0	8	8	4	-2
5	20.7	6	14.8	-3	6	6	3	-3
6	20.7	6	14.8	-5	5	6	2	-3
7	20.6	5	14.7	-5	4	5	2	-3
8	20.6	6	14.6	-5	4	5	2	-3
9	20.7	6	14.7	-3	6	6	3	-3
10	20.2	7	14.3	0	7	7	3	-4
11	19.4	9	13.6	4	9	8	2	-6
12	18.2	11	12.8	9	11	7	0	-9
13	17.1	13	12.0	14	12	7	-2	-14
14	16.2	16	11.3	18	13	6	-5	-19
15	15.5	21	10.7	24	15	5	-8	-24
16	14.8	25	10.2	27	15	3	-12	-31
17	14.2	27	9.8	27	14	1	-16	-36
18	13.6	28	9.5	26	12	-2	-21	...
19	13.4	29	9.4	27	11	-3	-23	...
20	13.5	29	9.5	27	12	-2	-21	...
21	13.9	26	9.6	25	12	0	-18	-38
22	13.5	22	9.4	20	9	-3	-20	...
23	13.5	18	9.5	17	8	-3	-19	-38
24	14.3	15	10.1	15	8	0	-14	-31

WESTERN AUSTRALIA

Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.2	5	7.0	-1	-21	...	...	...
2	8.6	-6	6.7	-4	-21	...	...	...
3	11.8	-1	8.8	1	-5	-16	-33	...
4	17.9	5	13.8	1	5	2	-6	-16
5	23.1	7	17.4	-3	7	8	5	0
6	23.4	7	18.0	-6	5	8	6	2
7	23.4	7	18.8	-8	4	7	6	2
8	23.2	7	18.8	-7	5	7	6	2
9	22.8	7	18.6	-5	6	8	6	1
10	22.3	8	18.1	-1	8	9	6	1
11	21.6	10	17.9	5	11	11	6	0
12	20.7	14	16.7	15	17	14	7	-1
13	19.7	19	15.8	26	22	16	7	-4
14	18.8	23	15.0	32	24	16	5	-7
15	18.3	24	14.5	33	24	16	3	-10
16	17.7	25	14.0	34	24	14	1	-13
17	17.1	26	13.9	34	23	12	-1	-17
18	16.2	27	12.7	33	20	9	-6	-23
19	15.3	27	11.9	31	18	5	-11	-30
20	14.4	28	11.1	29	14	0	-18	-39
21	13.8	28	10.6	27	11	-3	-23	...
22	13.9	26	10.4	25	8	-8	-29	...
23	13.0	24	9.8	20	3	-13	-36	...
24	11.4	17	8.6	10	-7	-25	...	...

Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.3	17	10.7	17	9	0	-15	-33
2	14.9	14	11.3	14	10	2	-10	-25
3	17.1	11	13.5	10	11	6	-2	-13
4	20.7	11	15.8	6	11	10	5	-2
5	21.6	9	16.0	2	9	9	5	-1
6	21.6	8	17.7	0	8	8	4	-2
7	21.4	7	17.5	-1	7	7	4	-2
8	21.2	7	17.3	-1	7	7	4	-2
9	21.0	8	17.1	0	7	7	3	-3
10	20.8	8	16.9	2	9	8	3	-3
11	20.2	10	16.6	5	10	9	3	-5
12	19.3	12	15.5	11	13	9	2	-7
13	18.3	15	14.6	16	15	10	0	-11
14	17.2	18	13.7	22	16	9	-2	-15
15	16.5	23	13.1	27	18	9	-5	-20
16	15.8	25	12.5	30	18	7	-8	-25
17	15.2	27	12.3	30	17	5	-11	-30
18	14.5	28	11.3	29	15	2	-15	-35
19	13.9	29	10.7	28	13	-1	-20	...
20	13.3	30	10.2	27	11	-4	-24	...
21	13.2	30	9.9	26	10	-5	-26	...
22	13.8	30	10.3	28	13	-1	-20	...
23	14.0	26	10.7	26	13	0	-18	-38
24	13.6	22	10.3	21	10	-2	-20	-39

EASTERN AUSTRALIA

Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.4	14	21.0	13	19	19	16	11
2	26.6	13	20.5	11	18	18	15	10
3	27.2	12	21.2	11	18	18	15	10
4	27.8	13	21.1	11	19	19	16	12
5	28.5	13	21.7	14	20	21	18	13
6	28.3	16	22.5	17	23	23	20	15
7	27.3	17	22.2	22	25	24	20	15
8	26.2	19	21.9	29	29	26	21	14
9	25.2	21	20.3	38	34	29	22	13
10	24.1	22	19.3	40	34	28	20	11
11	23.3	23	18.6	41	34	28	19	8
12	23.0	23	18.3	42	35	28	18	8
13	22.5	24	17.8	43	35	27	17	6
14	21.8	23	16.9	42	33	25	14	2
15	20.3	24	15.9	40	31	21	9	-4
16	18.9	25	14.7	38	28	17	4	-11
17	17.3	26	13.4	36	23	12	-3	-21
18	15.9	25	12.2	31	16	2	-17	-38
19	12.9	26	9.9	20	-1	-21	...	...
20	12.0	26	9.3	15	-8	-30	...	...
21	15.8	20	11.9	24	12	0	-18	-39
22	22.4	16	17.4	25	23	19	10	0
23	25.0	16	19.9	20	23	21	16	9
24	25.3	15	20.5	15	20	19	15	9

South Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.8	26	23.0	33	35	34	30	25
2	28.4	26	23.4	33	36	34	31	26
3	28.4	27	23.3	34	36	35	31	27
4	28.1	27	23.0	36	37	35	32	27
5	27.4	28	22.3	38	38	36	32	26
6	26.6	29	21.6	42	40	37	32	26
7	25.5	31	20.6	47	43	38	32	25
8	24.3	33	19.6	49	44	39	31	23
9	23.1	34	18.6	49	43	38	30	21
10	22.1	34	17.6	49	43	36	28	18
11	21.5	35	17.1	49	42	36	26	16
12	20.8	36	16.4	49	42	35	25	14
13	20.0	36	15.7	48	40	33	23	11
14	18.8	37	14.7	47	39	30	19	7
15	17.7	38	13.7	46	37	27	15	2
16	16.5	39	12.6	45	34	24	10	-3
17	15.5	40	11.8	43	31	21	6	-8
18	15.8	38	12.0	42	31	21	7	-6
19	18.2	33	13.6	39	33	26	15	3
20	21.6	30	16.4	37	35	31	23	14
21	24.3	28	18.8	36	35	33	27	20
22	25.3	27	19.9	34	35	33	28	22
23	25.8	27	20.6	33	34	32	28	22
24	26.7	27	21.8	32	34	33	29	24

USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.0	5	15.1	-3	4	4	0	-7
2	17.8	5	13.4	2	5	3	-4	-14
3	15.9	7	12.0	6	5	0	-10	-23
4	14.6	10	11.0	10	5	-3	-16	-33
5	13.7	14	10.3	13	4	-6	-23	...
6	13.1	18	9.8	16	3	-10	-29	...
7	12.6	24	9.6	19	3	-13	-36	...
8	12.5	26	9.3	20	2	-15	-38	...
9	12.2	28	9.3	20	1	-16	...	...
10	11.2	29	8.5	16	-6	-26	...	...
11	9.6	31	7.4	7	-19	...	...	...
12	9.3	31	7.1	4	-23	...	...	...
13	11.7	29	8.7	18	-2	-21	...	...
14	13.2	28	10.2	25	8	-7	-28	...
15	12.3	22	9.5	17	2	-12	-34	...
16	15.9	17	12.0	19	13	4	-8	-23
17	15.3	11	11.7	11	9	3	-8	-21
18	15.5	5	11.7	3	5	1	-7	-18
19	17.8	4	13.4	-3	4	3	-1	-9
20	21.1	5	16.2	-9	3	5	3	-1
21	23.7	6	18.4	-13	1	5	5	2
22	24.3	5	18.9	-14	1	5	5	2
23	24.6	5	18.6	-13	1	5	4	1
24	22.4	5	17.0	-8	3	5	3	-2

SOUTHERN AUSTRALIA

Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.0	11	16.8	8	12	11	5	-2
2	21.3	11	17.3	6	12	11	6	-1
3	21.7	11	18.0	5	12	11	7	0
4	21.8	11	18.0	6	12	11	7	0
5	21.6	11	17.8	7	13	12	7	0
6	21.4	12	17.5	10	14	12	7	0
7	21.1	14	17.2	14	16	13	7	-1
8	20.7	16	16.8	20	19	15	7	-2
9	20.0	21	16.2	31	25	18	8	-4
10	19.1	23	15.4	35	26	17	5	-9
11	18.2	24	14.6	35	24	14	1	-14
12	17.2	25	13.8	34	22	11	-4	-21
13	16.7	26	13.2	33	20	8	-8	-26
14	16.1	26	12.7	32	18	5	-12	-32
15	15.5	26	12.2	31	16	2	-17	-38
16	14.8	26	11.5	28	12	-2	-23	...
17	14.0	27	10.9	26	8	-8	-30	...
18	13.3	27	10.2	23	4	-14	-39	...
19	11.3	25	8.7	8	-19	...	...	...
20	10.6	25	8.2	3	-27	...	...	...
21	14.0	18	10.6	18	2	-14	-36	...
22	17.8	16	13.5	20	16	8	-3	-16
23	19.8	14	15.3	15	15	11	4	-6
24	20.6	12	16.2	10	14	11	5	-3

South Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.1	16	15.4	19	17	11	2	-10
2	19.2	16	15.8	19	17	12	2	-10
3	19.1	16	15.7	20	18	12	2	-10
4	19.0	17	15.5	21	19	12	2	-10
5	18.8	18	15.4	24	20	13	2	-11
6	18.6	20	15.2	27	21	13	1	-12
7	18.4	23	14.9	32	24	14	1	-13
8	17.9	26	14.5	36	25	14	0	-17
9	17.1	27	13.8	36	23	12	-4	-22
10	16.2	28	13.0	35	21	8	-9	-29
11	15.3	29	12.2	33	18	4	-16	-37
12	14.7	30	11.7	32	15	0	-21	...
13	14.1	30	11.2	30	13	-3	-26	...
14	13.6	31	10.7	28	10	-7	-31	...
15	12.9	31	10.1	26	6	-12	-37	...
16	12.3	32	9.5	23	2	-17	...	...
17	11.8	33	9.0	21	-1	-23	...	...
18	11.6	30	8.8	18	-3	-24	...	...
19	12.1	23	9.1	17	0	-18	...	...
20	13.7	18	10.1	17	6	-7	-26	...
21	15.8	17	11.9	19	12	2	-12	-29
22	17.5	16	13.4	20	15	8	-4	-18
23	18.4	16	14.4	19	17	10	0	-13
24	18.8	16	14.9	19	17	11	1-11	

USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.5	5	16.2	-5	4	6	3	-3
2	19.3	6	14.6	1	7	5	0	-9
3	17.4	8	13.2	6	8	4	-4	-15
4	16.1	10	12.1	10	8	2	-9	-23
5	15.2	14	11.4	14	9	0	-13	-29
6	14.4	17	10.8	18	8	-2	-18	-37
7	13.8	22	10.5	21	8	-5	-24	...
8	13.4	25	10.1	22	7	-8	-28	...
9	13.0	26	9.8	22	5	-11	-33	...
10	11.6	28	8.9	18	-2	-21	...	...
11	9.8	30	7.5	8	-17	...	...	...
12	9.4	31	7.2	5	-22	...	...	...
13	12.1	28	9.1	20	1	-17	...	...
14	14.2	28	11.0	28	14	1	-17	-37
15	14.0	22	10.7	21	11	-1	-18	-37
16	14.6	15	11.1	15	10	1	-11	-27
17	14.3	6	10.8	6	5	-1	-12	-26
18	15.0	1	11.2	0	3	0	-8	-20
19	17.0	1	13.4	-6	2	2	-3	-11
20	19.8	3	14.9	-11	1	3	1	-4
21	22.0	4	16.8	-15	0	4	3	0
22	23.2	5	18.1	-16	0	4	5	2
23	23.6	6	18.7	-15	0	5	5	2
24	23.9	5	18.2	-10	3	6	51	

WESTERN AUSTRALIA

Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.3	15	19.3	15	20	18	14	7
2	24.6	14	19.8	13	18	18	14	8
3	25.5	14	19.9	11	18	18	14	9
4	26.4	13	20.0	11	18	18	15	9
5	27.0	13	20.5	12	19	19	16	11
6	27.7	14	21.1	14	20	20	18	13
7	27.4	16	21.9	17	23	22	19	14
8	26.8	17	21.9	22	25	24	20	14
9	25.9	19	21.1	30	29	26	21	14
10	24.9	22	20.8	40	35	30	22	13
11	23.9	23	19.3	42	35	29	20	11
12	22.9	23	18.4	42	35	27	18	7
13	22.0	24	17.6	42	34	26	15	4
14	21.6	24	17.2	42	33	25	14	2
15	21.1	24	16.7	42	32	24	12	0
16	20.4	24	15.7	40	30	21	9	-5
17	19.1	24	14.8	38	27	17	3	-12
18	17.9	24	13.8	36	23	11	-4	-21
19	16.0	24	12.3	31	15	0	-19	...
20	12.9	25	9.9	18	-4	-25	...	...
21	12.0	25	9.3	14	-12	-36	...	...
22	15.7	21	12.2	26	12	-2	-21	...
23	21.2	17	16.4	24	22	17	9	-1
24	23.7	16	18.5	20	22	19	14	6

South Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.9	12	18.2	9	15	14	10	3
2	23.1	12	18.7	9	15	14	10	3
3	23.3	13	17.3	10	15	15	10	4
4	23.3	13	19.1	11	16	15	11	4
5	23.0	14	18.9	14	18	16	11	4
6	22.9	15	18.7	18	20	18	12	4
7	22.6	18	18.4	24	24	20	13	4
8	22.3	20	18.1	31	27	22	14	4
9	21.5	22	17.3	35	30	23	14	3
10	20.5	24	16.4	38	30	22	12	0
11	19.4	26	15.5	38	29	20	9	-4
12	18.5	27	14.8	38	28	18	5	-9
13	17.7	28	14.1	37	26	16	2	-13
14	17.0	28	13.5	37	25	14	0	-17
15	16.4	29	12.8	35	23	12	-3	-21
16	15.7	29	12.1	34	21	9	-7	-26
17	14.9	30	11.4	33	19	6	-12	-31
18	14.3	30	10.9	30	16	2	-16	-37
19	14.1	24	10.6	24	12	0	-17	-37
20	14.7	20	11.0	20	12	2	-13	-30
21	16.7	16	13.2	18	14	7	-4	-17
22	19.3	14	14.6	14	15	11	3	-6
23	21.4	13	16.5	12	16	14	8	0
24	22.5	13	17.6	10	15	14	9	2

USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.8	3	14.9	-10	1	3	1	-4
2	17.6	3	13.3	-5	3	3	-2	-10
3	15.6	2	11.8	-1	3	1	-6	-17
4	14.3	3	10.7	3	4	-1	-11	-24
5	13.4	6	10.0	6	4	-3	-16	-32
6	12.7	9	9.5	9	3	-6	-22	...
7	12.3	14	9.3	13	3	-9	-27	...
8	12.2	20	9.1	16	3	-10	-30	...
9	12.1	25	9.1	19	4	-12	-34	...
10	11.1	28	8.5	17	-1	-20	...	...
11	9.7	31	7.4	11	-13	-36	...	...
12	9.4	33	7.2	9	-17	...	...	...
13	11.8	31	8.8	21	2	-15	...	...
14	16.0	29	12.4	34	22	11	-4	-21
15	13.4	27	10.3	25	12	0	-19	-39
16	13.2	20	10.1	18	9	-2	-18	-37
17	15.4	15	11.9	15	12	6	-4	-17
18	14.6	8	11.2	7	7	3	-7	-19
19	14.3	1	10.8	1	4	1	-7	-19
20	15.0	-2	11.2	-4	2	1	-5	-14
21	17.1	0	13.4	-10	1	2	-1	-7
22	19.8	2	15.0	-16	0	3	2	-1
23	22.0	4	16.9	-18	-1	4	4	2
24	22.3	4	16.9	-15	0	4	4	0

LONG PATH

EASTERN AUSTRALIA

Europe

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.9	-12	7.4	0	-5	-14	-29	...
2	10.2	-6	7.7	1	-5	-15	-31	...
3	10.4	-2	8.0	3	-4	-15	-33	...
4	9.9	0	7.7	3	-7	-20	-39	...
5	9.0	4	7.0	2	-12	-29	...	...
6	8.9	11	7.0	2	-16	-35	...	...
7	10.4	20	8.3	10	-7	-24	...	...
8	13.7	23	10.9	22	9	-4	-22	...
9	14.6	24	11.2	25	15	5	-8	-24
10	14.4	15	10.9	15	10	3	-9	-23
11	17.3	9	13.7	6	9	6	0	-9
12	16.6	3	13.1	-2	4	2	-3	-11
13	15.9	-3	12.8	-8	0	0	-4	-12
14	15.1	-8	11.8	-11	-2	-1	-6	-13
15	14.4	-12	11.1	-13	-3	-2	-7	-14
16	13.8	-15	10.5	-13	-3	-3	-7	-15
17	13.6	-16	10.2	-13	-3	-3	-8	-16
18	14.2	-14	10.6	-14	-3	-3	-7	-14
19	16.1	-8	12.7	-15	-4	-2	-5	-12
20	14.3	-11	11.1	-11	-3	-3	-8	-17
21	12.4	-14	9.5	-7	-2	-5	-13	-24
22	11.1	-17	8.5	-4	-2	-7	-18	-31
23	10.3	-17	7.8	-2	-3	-10	-22	-37
24	9.9	-16	7.5	-1	-4	-12	-26	...

SOUTHERN AUSTRALIA

Europe

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.5	-14	7.2	0	-6	-16	-33	...
2	9.7	-8	7.5	0	-7	-18	-36	...
3	9.8	-3	7.6	1	-8	-21	...	...
4	9.4	0	7.3	1	-11	-26	...	...
5	8.5	2	6.7	-1	-18	-37	...	...
6	8.3	8	6.6	-2	-23	...	...	...
7	9.6	16	7.6	4	-16	-36	...	...
8	12.3	22	9.8	16	0	-15	-37	...
9	15.8	21	12.4	25	14	3	-12	-29
10	12.9	21	9.9	18	6	-7	-25	...
11	12.0	13	9.2	11	1	-11	-29	...
12	15.4	10	10.7	9	8	2	-8	-20
13	14.8	2	10.5	1	3	0	-8	-18
14	14.1	-5	9.8	-5	0	-2	-9	-19
15	13.5	-11	9.4	-8	-2	-3	-9	-19
16	13.1	-14	9.2	-10	-2	-3	-10	-19
17	13.1	-16	9.2	-11	-3	-4	-9	-18
18	13.8	-14	9.8	-12	-3	-3	-8	-16
19	15.4	-9	10.6	-14	-3	-3	-7	-15
20	13.3	-14	10.4	-10	-3	-4	-10	-20
21	11.5	-24	8.9	-10	-6	-10	-19	-32
22	10.3	-33	8.0	-12	-11	-18	-30	...
23	9.6	-32	7.4	-9	-11	-20	-34	...
24	9.4	-22	7.2	-3	-8	-17	-33	...

WESTERN AUSTRALIA

Europe

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.2	-38	7.0	-12	-16	-25	...	...
2	9.4	-20	7.3	-3	-7	-16	-31	...
3	9.5	-15	7.4	-2	-8	-18	-35	...
4	9.1	-14	7.1	-2	-10	-22	...	...
5	8.2	-14	6.4	-3	-15	-30	...	...
6	8.0	-10	6.3	-4	-19	-36	...	...
7	9.2	1	7.3	-1	-15	-32	...	...
8	11.6	10	9.2	7	-5	-18	-37	...
9	14.8	14	11.9	15	6	-3	-18	-34
10	14.8	17	11.5	18	9	0	-13	-29
11	12.3	15	9.5	12	1	-11	-29	...
12	12.0	7	9.2	7	-1	-11	-27	...
13	15.8	4	10.9	3	4	0	-8	-19
14	15.3	-2	10.4	-4	0	-2	-8	-17
15	14.6	-9	10.1	-10	-3	-4	-9	-18
16	14.0	-13	9.5	-12	-4	-5	-10	-19
17	13.3	-17	9.1	-13	-5	-6	-11	-19
18	12.9	-19	8.9	-13	-5	-6	-11	-20
19	12.9	-20	8.9	-14	-5	-6	-11	-20
20	12.7	-19	9.4	-12	-5	-7	-13	-23
21	10.9	...	8.6	-22	-16	-20	-30	...
22	9.8	...	7.7	-27	-25	-31	...	...
23	9.3	...	7.2	-26	-26	-34	...	...
24	9.0	...	7.0	-21	-23	-33	.....	

IARUMS — Intruder Watch

Gordon Loveday VK4KAL Federal Intruder Watch Co-ordinator
Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4UN-1

Review time has caught up again. The most blatant infringement still comes from USSR (now CIS). A letter from DoTC to VK2COP in Feb 1985 stated, quote "the USSR has agreed to remove intruder UMS (Moscow Naval Radio) from 21.032 and 14.141 MHz". We are still reporting this intruder, so how much notice can we take of their word? UMS still rates the most intrusions per year.

It also appears that I have upset some amateurs by stating "I welcome observations from all amateurs whether they are members of the WIA or not". I make no apologies for that, I would like to direct those persons to the article in October issue of "AR", page 5, 1st column, 2nd last paragraph! I like to think amateur radio has a broader outlook on its activities. I welcome observations without exception.

Section 5 of the Monitoring System Manual covers many subjects, including Personnel, Equipment, Hours of Work, Types of Monitoring, Bands etc, 10 sections.

Let me comment on "hours of work". Monitors must be able to put aside two or three hours minimum per week. Less than this results in loss of familiarity with the patterns of activity on the bands being monitored.

Types of monitoring, general coverage and specific. Some monitors are experts in a particular mode viz, A1A (CW) or F1B (RTTY). These persons should be encouraged as the "obs" ends up with an intimate knowledge of that band. It is a pity that the manual is 25mm thick. It offers help in decoding A1A text in Arabic, Turkish, Hebrew and Cyrillic Russian.

My thanks to those who participated in the IBF Survey, the outcome will be published in due course.

I hope Christmas 1992 was happy at your QTH.

73 VK4KAL

ar

Stolen Equipment

Stolen during the 1st week of December 1992, from the radio shack of VK3MT/VK3COT, at the Royal Melbourne Institute of Technology (RMIT), City Campus, 124 Latrobe Street, Melbourne, ICOM IC734 HF Transceiver, with Power Supply and handset. IC734 Serial No 06196, Power Supply Serial No 0180.

The transceiver is engraved on the heatsink inside the set, and on the bottom of the top cover.

Please contact John Tobin at RMIT Security (03) 660 2490. Information from Craig Cook VK3CMC (03) 660 4345 (B.Hrs), Fax (03) 662 2525.

★ ★ ★ ★

Stolen on 27th November 1992 from Signal Hill at Goulburn, NSW, Goulburn Amateur Radio Society Inc :—

Pac-Comm Tiny 2 Terminal Node Controller, S/N T5782.

Pac-Comm Tiny 2 Terminal Node Controller, S/N T6784.

YAESU UHF Transceiver model FT712, S/N 81120576.

Phillips FM828 transceiver, S/N 42459.

Power Supply, unidentified, known as FRY1501.

Please contact Goulburn Police (048) 21 2344, or (048) 21 2534.

Purchasers of used amateur radio equipment are requested to be alert for signs of removal of Serial or ID numbering.

★ ★ ★ ★

ICOM IC730 HF Transceiver S/N 13814689, from the radio shack of Royal Melbourne Institute of Technology (RMIT) approx 5th Nov 1992. May have RMIT ident engraved thereon, or a small aluminium label pop-riveted with appropriate words of ownership. Stolen with microphone, but DC power cord left behind. Contact John Tobin at RMIT Security (03) 660 2490, or Craig Cook VK3CMC (03) 660 4345 (B Hrs).

ar

Awards

John Kelleher VK3DP Federal Awards Manager

DXCC Profile
Stuart Millowick VK5MS

Stuart Millowick VK5MS, 1991.

Stuart became interested in amateur radio in 1934 as a schoolboy.

He assisted George Chandler VK3AC with his Sunday broadcasts on the 200 metre band. He also constructed several short-wave receivers, listening to overseas broadcasts. That is when the DX bug bit him.

In 1940 he completed his electrical apprenticeship, moving to Mount Gambier via Penola. He obtained his AOCP in June 1947 and came on air in September that year. Stuart conducted experiments with John Sheard VK5JA on two metres. Prior to 1950 when 240v was installed, he utilised a 12 volt generator and petrol engine for power. He built a new rig using an 815 pa, plate modulated with 807's for around 50 watts input. His receiver was an Eddystone 640. This gear was updated around 1953 and a brand new home brew 3 element beam for 20 metres DX was really booming around 1963 and Stuart became the first VK station to confirm 300 countries on AM. In the 1960's he acquired a new FT-100 and retired the old gear. On the 14th November 1966, he was made a member of the ARRL DXCC honour roll. On a visit to the USA in 1968 he purchased a Drake Line TR3-R4A, T4XB/R4B. This equipment is still in use.

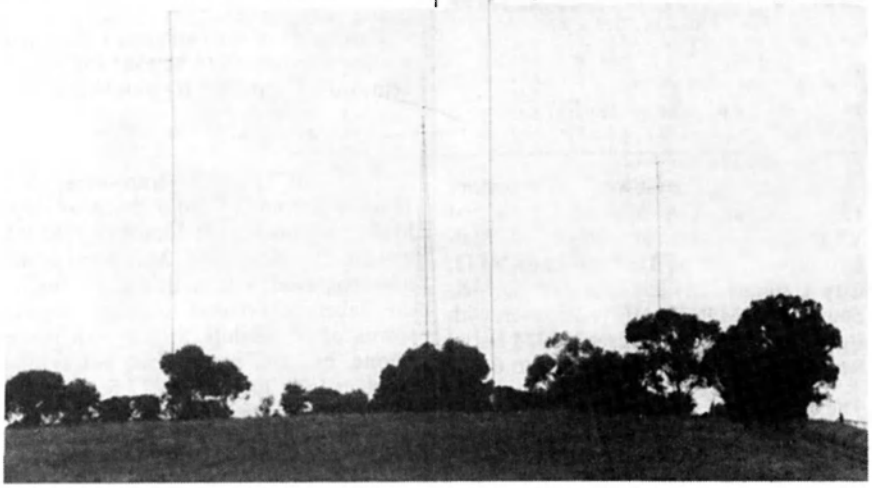
Stuart in the early days of his Amateur Radio activities, with his mainly home brew equipment.

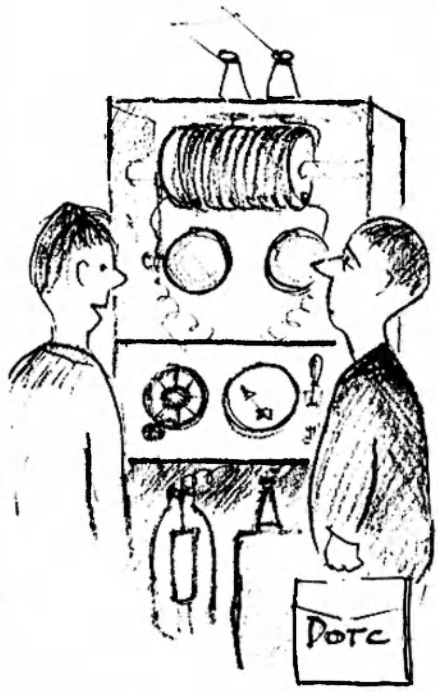
His advice to those aspiring to higher levels of DXCC is.....

(1) Set yourself a reasonable progressive total.
(2) Don't be in too much of a hurry.
(3) Spend a lot of time listening.
(4) Try working often in contests to hone your operating skills.
(5) Make sure that your equipment is reliable and accurate.
(6) Always abide by good operating skills and etiquette.
(7) Remember your family responsibilities, and keep within your working finances.

ar

The 1992 VK5MS Antenna Farm.





"But the chap said — just tune it up for maximum spark and it would go like a rocket on all bands. It's good for the ozone layer too."

CONTESTS

Peter Nesbit VK3APN — Federal Contest Coordinator
24 Sovereign Way, Avondale Heights, 3034.

Contest Calendar Jan-Mar 93

Rules, where already published, are in the indicated issue.

Jan 1	Straight Key Night (Dec 92)
Jan 2/3	ARRL RTTY Roundup (Dec 92)
Jan 16/17	WIA VHF/UHF Field Day Contest
Jan 16/17	HA CW DX Contest
Jan 29/31	CQ Worldwide 160 Metre CW Contest
Jan 30/31	UBA SSB DX Contest
Jan 30 — Feb 7	ARRL Novice Roundup
Feb 13/14	PACC CW/SSB DX Contest
Feb 13/14	RSGB 160 Metre CW Contest
Feb 13/14	Spanish RTTY Contest
Feb 20/21	ARRL DX CW Contest
Feb 26/28	CQ Worldwide 160 Metre SSB Contest
Feb 27/28	RSGB 7MHz CW Contest
Feb 27/28	UBA CW DX Contest
Mar 6/7	ARRL DX SSB Contest
Mar 13/14	BERU CW Contest
Mar 20/21	WIA John Moyle Field Day
Mar 20/21	Bermuda Contest
Mar 20/21	BARTG RTTY Contest
Mar 27/28	CQ WPX SSB Contest
Mar 27/28	RSGB 160m SSB Contest

Once again some interesting contests coming up, including three popular European DX contests (HA, UBA and PACC), a couple of 160m contests, and the Spanish RTTY contest. If you submit a log, don't forget to include your call sign, name and address (it's amazing how many people do forget)!

If you don't want to go through the rigmarole of producing and submitting full logs, check logs are always welcomed.

Please forward material, suggestions etc. to me at the above address at least five weeks before the month of issue. Until next month, good contesting!

73s, Peter VK3APN

HA CW DX Contest

This popular European HF contest is CW only, and is scheduled for 2200z Saturday to 2200z Sunday, 16/17 Jan.

Exchange RST plus serial number starting at 001. Hungarian stations will also send a 2 letter code indicating their county. Possible codes are: BA BE BP BN BO CS FE GY HA HE KO NO PE SA SO SZ TO VA VE ZA.

Score 6 points per Hungarian QSO, and 3 points per non-Hungarian QSO in other WAC continents. Final score is total QSO points times total Hungarian counties worked per band.

Send log, summary sheet, declaration etc. to arrive by 26 Feb at: Hungarian Radioamateur Society, Box 86, Budapest H-1581, Hungary.

UBA SSB/CW HF Contest

This is sponsored by the Belgium Amateur Radio Union (UBA), and runs from 1300z Saturday to 1300z Sunday, SSB on 30/31 Jan and CW on 27/28 Feb. Any station may work any other worldwide.

Categories include single operator single band, single operator all band, multioperator single transmitter, and QRP 10W max.

Frequencies: CW 3500-3560, 7000-7035, 14000-14060, 21000-21060, 28000-28060; SSB 3600-3650, 3700-3800, 7040-7100, 14125-14300, 21200-21400, 28500-28800.

Exchange RS(T) plus serial number. Belgian stations will add their province abbreviation.

Score 10 points for contacts with Belgian stations, 3 points with other European stations, and 1 point with others. The multiplier is the total of Belgian provinces, Belgian prefixes, and European countries. Total score is QSO points times multiplier.

Send log, summary sheet, declaration etc. within 30 days to: UBA HF Contest, Oude Gendarmeriestraat 62, B-3100 Heist Op Den Berg, Belgium.

CQ Worldwide 160 Metre Contest

This contest runs from 2200z Friday to 1600z Sunday, CW on Jan. 29-31, and phone on Feb. 26-28 (note different date to that shown in last month's Calendar). The object is to contact as many stations worldwide on 160m as possible. VK to VK contacts are permitted for contest credit.

Categories are single and multioperator. The use of packet, a spotting net, or logging assistant makes you multi-op. Use of a computer does not.

Exchange RS(T) plus prefix or country abbreviation (W/VE will send RST plus state/province).

Score 2 points for contacts with stations in own country, 5 points with stations in other countries in the same continent (continental boundary as for WAC), and 10 points with stations in other WAC continents. Points for contacts with /MM stations depend on their location. Countries as per ARRL DXCC list.

Multipliers include U.S. states (max 48, KH6 & KL7 are not included); Canadian provinces (max 13, including VO1, VO2, NB, NS, PEI, VE2, VE3, VE4, VE5, VE6, VE7, NWT, Yukon); DX countries, including KH6 and KL7; maritime mobiles. *W/VE contacts can be claimed for state/province multipliers, but NOT for country multipliers.*

Indicate the multiplier in the log only the first time it is worked. The final score is the total QSO points times total multiplier (U.S. states + VE provinces + DX countries + maritime mobiles). The preferred format for hardcopy logs is 40 contacts per page, with contacts and multipliers sub-totalled on each page.

Check sheets are required for logs containing 200 QSOs or more. Include a summary sheet showing call/name/address, category, score, station details, a signed declaration that all rules were observed, and any anecdotes/observations. Indicate CW or SSB on the envelope and mail to: "CQ 160 Metre Contest", 76 North Broadway, Hicksville, NY 11801. Mailing deadlines are 28 Feb for CW, and 31 March for SSB.

Certificates will be awarded to the top scoring stations in each DXCC country, and where scores are close, to runners-up.

ARRL Novice Roundup

The object is for novice and technician operators in the U.S and possessions to work as many other stations as possible, on authorised modes and frequencies, between 0000z 30 Jan and 2400z 7 Feb. Exchange RS(T) plus country (W/VE will send RS(T) plus state/province). As VK novices count as "other" and are on the same footing as full calls (according to the '92 rules), this contest is of limited interest outside W/VE. Brief details are included here, however, to encourage VK participation and possibly give some US novices their first VK contacts.

PACC (Holland) CW/SSB DX Contest

The PACC is another popular European contest, with both phone and CW held on the same weekend, and is scheduled for 1200z Saturday to 1200z Sunday, 13/14 Feb. The object is to work as many Dutch stations as possible.

All bands 160 to 10m may be used, excluding the "WARC" bands. CW only on 160m. Stations may be worked only once per band, regardless of mode. Categories are single and multioperator.

Exchange RST plus serial number starting at 001. Dutch stations will also send a 2 letter code indicating their province. Possible codes are: DR FR GD GR LB NB NH OV UT FL ZH ZL.

Score 1 point per Dutch QSO. Final score is total QSO points times total Dutch provinces worked on each band (max 72).

Mail logs by 31 Mar to: PACC Contest, PO Box 499, 4600 AL Bergen op Zoom, The Netherlands. Certificates will be awarded to the top scoring stations in each category, in each country and call area of VK, ZL etc.

RSGB 160 Metre Contest

This contest is scheduled for 2100z Saturday to 0100z Sunday, CW 13/14 Feb, and SSB 27/28 March. The object is to work as many British Isles stations as possible (GI is considered part of the British Isles, but not EI).

Categories are (a) British Isles and (b) Overseas including EI, single operator only. Frequencies are 1820-1870 Khz, CW only.

Exchange RS(T) plus serial number starting at 001. British Isles stations will include their county code. Score 3 points per QSO, plus a bonus of 5 points for the first QSO with each county.

Send log, summary sheet, declaration etc. by 1 March to: RSGB HF Contests Committee, c/o S. Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England. Certificates will be awarded to the leading three entrants in the overseas category.

Spanish RTTY Contest

This contest is scheduled for 1600z Saturday to 1600z Sunday, Feb 13/14. The object is to contact as many stations worldwide as possible, on RTTY, 80 to 10m.

Categories include single operator single band, single operator multiband, multioperator single transmitter, and SWL.

Exchange signal report and CQ zone. Spanish stations will send signal report and province.

On 10-20m score 1 point per QSO with stations inside your WAC continent, and 2 points with stations outside your WAC continent. On 40 and 80m, the QSO points are tripled. QSOs between stations in the same country can be claimed for multiplier credit, but not QSO points.

The multiplier is the sum of the DXCC countries and Spanish provinces (max 52) per band. The final score is the total QSO points times the multiplier.

Send log, summary, declaration etc. by 9 April to: EA RTTY Contest, c/o EA1MV Antonio Alcolado, PO Box 240, 09400 Aranda de Duero (Burgos), Spain.

Results of 16th Annual VK6 3.5MHz CW/SSB Contest

CW Section:

VK6AF	1800
VK6AFW	1350
VK6BWI	770

SSB Section:

VK6XG	15456
VK6WJH	10868
VK6AFW	10290
VK6RG	8626
VK6DE	8424
VK6AMB	6916
VK6MO	6494
VK6BWI	5250
VK6DA	2948
VK5AYD	2184
VK5NYD	2184
VK6NRE	1800
VK5PMC	972

Conditions for both sections were very good, with some good CW contacts with all of VK, and some DX contacts to ZL.

More participation by VK6 stations would have been appreciated by all, especially in the CW section, so how about it next time! It's a friendly contest of only 3 hours duration.

73s, C. Waterman VK6NK

Regional Results of 1992 ARRL DX Contest

(Shown in order: call, score, QSOs, multiplier, band. M=multiband)

CW Single Operator:

VK2APK	1,033,968	1657	208	M
VK2AYD	226,800	525	144	M
VK6HG	29,394	142	69	M
VK2DID	11,844	84	47	M
VK2AYK	1,632	32	17	40
VK4TT	20,640	160	43	20
VK4XA	133,002	821	54	10
VK8BE	2,280	40	19	10
VK9XM (Lord Howe Isl, W5BOS opr)				
	6,570	73	30	10
ZL3GQ	130,845	793	55	40
P29DK	40,545	159	85	M

Phone Single Operator:

VK2AYK	495,582	1094	151	M
VK5GN	275,940	630	146	M
VK1PS	102,900	343	100	M
VK3DZM	13,716	127	36	80
VK2GAH	239,772	1378	58	10
VK2ARJ	219,240	1260	58	10
VK8TM	131,040	780	56	10
ZL4NF	193,914	567	114	M
ZL2AH	152,028	492	103	M
ZL2LOW	126,498	727	58	M
ZL11M	20,043	131	51	M
ZL2AFY	3,813	41	31	M
P29DX	2,003,100	3035	220	M

Continental leaders for Oceania include:

VK2GAH	(10m phone)
VK3DZM	(80m phone)
ZL3GQ	(40m CW)

The top 10 single band scores include:

VK3DZM	9th outright 80m phone
ZL3GQ	6th outright 40m CW

(from QST Oct 92) ar

FTAC Notes

John Martin
VK3ZJC FTAC Chairman

Call Book Update

Here are some corrections which just missed out on the deadline for inclusion in the 1992-1993 Call Book.

The Elizabeth Amateur Radio Club has advised that its repeaters are all operational. The Packet systems are on 144.800 and 439.050 MHz. The club also operates a beacon on 1296.550 MHz and has one planned for 2304.550 MHz.

The Yorke Peninsula Repeater Group is testing VK5RLH (146.925) on Bumbunga Hill. It serves the mid North and all around Spencer Gulf. Other data is T, 80, 430, 5.0, SYP.

VK3REG (146.650) is to move to Mt Cann (530m) by early 1993. VK3REB (146.900) is now on Mt Nowa Nowa (354m). VK3RGO (147.050) has an ERP of 20W.

The list should have included VK3RHO (146.850) Mt Buller, Eastern Victoria, O, 30, 1862, 2.5, VWE.

In the beacon list, all entries for VK3RMV should be deleted, and VK5RLZ added on 1296.550 (o) and 2304.550 (P).

The 50 MHz band plan in the Call Book contained an oversight on my part. The footnote relating to time-shared beacons on 50 MHz should have been deleted, as the time-sharing has been dropped.

ar

Remember to leave a three second break between overs when using a repeater.

Commonwealth Contest 1992 — Results

Compiled by John Tutton VK3ZC

Although in excess of 60 different VKs were heard exchanging serials in this year's contest, only 32 of them submitted logs as part of the grand total of 132, the largest for some years.

Conditions were quite good, and locally, the average scores were well up on recent years. Many would have been very pleased to work ZD8LII and VP8GAV whose signals came through very well on the Sunday afternoon, and had great pile-ups on them from this area.

The old VE6OU seems to have settled down in Ontario and with his new call VE3EJ, really spreadeagled the opposition with what must surely be an all time record score.

Three VKs made the top ten, with VK2BJ's 6255 bettering the previous Australian record of 6190 set by VK6LW in 1990.

Top Ten	80	40	20	15	10	Total
1. VE3EJ	685	1885	2340	2195	1310	8415
2. VE7CC	400	1385	2085	1990	1615	7485
3. ZL3GQ	770	1115	2035	2105	980	7005
4. ZD8LI	150	1265	1760	1860	1695	6730
5. VK2BJ	685	1180	2105	1365	920	6255
6. VK2APK	740	960	1960	955	845	5460
7. ZC4CZ	270	965	1475	1235	1165	5110
8. G3MXJ	275	915	1450	1250	1170	5060
9. C56/GH3YOR		515	1375	1320	1405	4615
10. VK4XA	395	695	1680	1185	660	4535

Australian Scores

	80	40	20	15	10	Total
5 VK2BJ	685	1180	2105	1365	920	6255
6 VK2APK	740	960	1960	955	845	5460
10 VK4XA	395	695	1680	1105	660	4535
21 VK5BN	475	510	1380	865	405	3635
25 VK5GZ	350	675	1520	765	155	3465
29 VK3ZC	440	910	940	775	200	3265
40 VK8HA	75	325	990	580	745	2715
41 VK6RU		325	930	825	605	2685
52 VK3DQ	415	435	985	250	225	2310
55 VK2EL		500	1090	655	50	2295
55 VK4OD	325	360	835	775		2295
56 VK2DID	255	625	575	640	150	2245
57 VK6BB	75	345	800	620	375	2215
63 VK4XW	315	560	605	535	50	2065
66 VK2AYD	295	600	720	380	25	2020
76 VK2AQF	280	510	665	305		1760
77 VK3XB	255	325	665	505		1750
82 VK3BXA	80	485	785	125	100	1575
87 VK6RZ		460	425	435	150	1470
92 VK7RY	260	450	300	200	150	1360
95 VK6HG		100	450	445	205	1200
98 VK2AIC			450	355	305	995
101 VK3XF	200	400	275			875
111 VK7GB		190	15	100	75	380

Single Band Entries

3.5 MHz
1. VK2ETM 410

7 MHz
1. VK7RO 1080
2. VK3APN 890
3. VK6LW 690

14 MHz
1. VK6AJ 2005
2. VK4TT 1985
3. VK3MR 1090

21 MHz
4. VK5AGX 910

Other Pacific Area Scores

3. ZL3GQ 7005
11. ZL1AIZ 4430
17. ZL1MH 4020
65. ZL1HV 2055
72. ZL2BCH 1820
81. ZL2BRT 1580

The following Commonwealth Call Areas were active during the event; A2, C5, G, GB5CC, J8, P2, P29HQ, V4, V8, VE1-2-3-4-5-6-7, VK1-2-3-4-5-6-7-8, VO1, VP2M, VP5, VP8, VP9, VS6, VU, Z2, ZB, ZC, ZD8, ZL1-2-3-4, 3B8, 4S7, 5B, 5Z, 6Y, 7Q, 8P, 9J.

No doubt many VKs would have been pleased to pick up a few of this lot.

RSGB Comments

"Canada was the place to be for top honours this year and congratulations to John Sluymer VE3EJ (formerly VE6OU/3), for his record breaking score of 8415 points, beating runner-up Lee Sawkins VE7CC by nearly a thousand points. RSGB HF Committee Chairman Bob Whelan G3PJT, at the start of a business trip to British Columbia, used VE7SV's station to lead the single band entries. Single band entries are not to everyone's taste but they do allow operators to grab a reasonable amount of sleep while staying competitive, and the single band entries have been tabulated separately this year to make for easier comparison.

In the UK, Dennis Andrews G3MXJ, takes the Colonel Thomas Rose Bowl, followed by Jan Fisher G0IVZ, in his first attempt in BERU. Special mention must be made of Frank Cooper, G2QT: this year is his fiftieth entry in BERU, an incredible achievement. Licensed in 1933, he first entered in 1935 and has only missed one year — 1968- when he was abroad. Even then he made arrangements to operate from VP6 (now 8P6) but circumstances meant that the station which he was supposed to use was unavailable. Now aged 78 and retired less than two years, he spends a great deal of time on antenna experiments and has notebooks containing all the results of his antenna work going back to 1933. In addition to a homebrew three element quad on a commercial lattice tower for HF, he has five wooden masts between 50 and 60 ft in height which he raises and lowers single handed with the aid of a winch for maintenance purposes. (The creosote does its job well as half of one mast is pre-war).

Currently the masts support a five-element and two three-element wire yagis for 40m, and a W8JK for 80m. He modestly describes himself as "a consistent also ran" but it is the enthusiasm and dedication of stalwarts like G2QT which make BERU such a special event.

Entrants again suffered QRM from the Japanese 59-Magazine CW contest, but thanks to the considerable efforts of David Rankin 9V1RH, and Masayoshi Fujoka, JM1UXU, the Chairman and Secretary respectively of IARU Region 3, the Japanese have restructured their event into separate 48-hour LF and HF contests to be held on 8-10 January from 2200h and 9-11 April from 2300h (1993 dates), thereby avoiding a clash with BERU. The best way of ensuring that we do not get jumped on by another contest is to keep the activity level high, and this year's record score indicates that the trend is in the right direction. See you all on the second weekend in March 1993, and bring a friend!"G3AEZ

1993 Commonwealth Contest

The Commonwealth Contest for 1993 will be held from 1200Z 13th March 1993, to 1200Z 14th March 1993. The rules will be published in the February 1993 issue of "Amateur Radio" magazine.

ar

Divisional Notes

VK2 Notes

Tim Mills VK2ZTM

A Happy New Year to all and hopefully better than the last. The change of years is an important time for the Division. The financial year starts for the Division on Jan 1st. Before we know it there is another AGM which will be on Sunday May the 2nd. The close for agenda items and Council nominations is Wednesday March the 17th. Annual reports have to be in the hands of the Secretary by January 31st.

The Parramatta office will close 18th December and reopen January 11th. First Wednesday night opening January 13th. The VK2WI broadcasts for December 27th and January 3rd will be morning only. Both sessions resume January 10th. Mail and FAX handled as usual during the holiday break. The first Trash and Treasure for 1993 will be Sunday afternoon the 24th January, earlier in case the last weekend becomes a long weekend.

The Divisional component of the subscription for 1993 remains unaltered.

1993 Exams

The exams conducted by the Division at Parramatta will be Sunday February 21st, May 23rd, August 29th and November 7th. Note the change in February to that previously advised. The Gosford Field Day has moved to a later date as well as a change of venue (Wyong Racecourse — Sunday February 28th.) Since almost everyone attends the Central Coast Field Day you may have been lonely at the exam.

Forums

During November there were three meetings which addressed aspects of the hobby in VK2. The first on the 21st saw 25 with an interest in ATV meet to discuss channel sharing in the Sydney region. On the 22nd over 40 packet users met throughout the day to cover the wide ranging agenda. Details have already been distributed via the packet networks A "NSW packet radio committee" was established by the forum attendees. It's an advisory committee with the charter "to improve, oversee and co-ordinate packet radio in New South Wales", though it has no regulatory powers. The committee is to meet again in February.

The third meeting on the 25th was for the Divisional Volunteers on the planning underway to improve the Division's operation. The functions and services of the Division had been raised at the open forum in August. The investigation following the forum identified five distinct sections, being, Administration, Member Services, Education, Advertising and Publicity and finally Technical Services. These sections are made up of more than 50 functions and services currently provided by the Division. An expanded report is to appear elsewhere and via the broadcasts.

Repeater Applications

During November the following applications were processed and forwarded to the DOTC. For WICEN (NSW) Inc portable repeaters for operation anywhere in VK2 on 2 metres, VK2RFI on CH 7150 and VK2REP on ch 7175. A 70 cm packet link channel on VK2RWI. A 10 metre voice repeater for the Wagga Wagga DX Group on 29.640 Tx — 29.540 MHz Rx, requested callsign VK2RHF. A packet repeater on 2 m for the Far South Coast ARC on ch 4875 & 70 cm linking. Goulburn ARS to add an additional 2 metre packet channel 7575 to VK2RGN. Summerland ARC to add a 6 metre repeater to VK2RIC on ch 3550 and plan to establish a 2 metre voice repeater — VK2RPG — near Pretty Gully.

Applications were being processed for Tamworth RC for a 70 cm packet link, and a packet channel 4800 and 70 cm links for the University of Technology Sydney ARS at Broadway.

A reminder to repeater groups that the guidelines for repeater establishment, operation and maintenance is detailed on page 27 of the new callbook. Contact the VK2 office for the required paperwork to establish or alter a system. This speeds up the processing. The DoTC will hold or send on paperwork to the Divisional repeater Co-ordinator if you send it direct to them.

Please check the new callbook for your current repeater listings. Advise without delay any corrections for next months DATA issue of "AR".

Join or Renew and Win a Rig!

The NSW Division is running a special membership and recruitment promotion: members who renew, or non-members who join up, between 1 December 1992 and 28 February 1993 will be eligible to win a new rig from Kenwood.

But wait! There will be not one, but TWO, rigs to win.

First prize will be a TM-732A dual-band 2m/70cm mobile rig, while second prize will be one of the just-launched TM-28 2m handheld rigs. Both prizes will be awarded by way of a draw.

And for new members who join up in the period there's a bonus: Kenwood is donating an amateur radio world map "place mat" to the first 100 new members to sign up.

Kenwood Electronics Australia has generously agreed to sponsor the promotion by donating the prizes. If you haven't heard the full details on the VK2WI Sunday news broadcasts yet, then listen out as soon as you can.

VK6 Notes

Harry Atkinson VK6WZ.

The year 1993 has begun and with the festivities behind us it could be a good time to think about the future.

There can be no doubt that '93 will end with our hobby looking a lot different compared with the situation at the end of '92. De-regulation is sure to become more widespread; the old rules many of us were brought up on will have disappeared; there will be a greater responsibility on each and every licensee to "keep his nose clean" without the fear of someone watching every move from "on high".

Regrettably, there will be some who confuse freedom with open slather but the vast majority of amateur operators will continue to take pride both in our hobby and in their reputations as good citizens.

The President VK6LZ and councillors of the Division wish you a happy and successful New Year.

ar

New Members

Our usual warm welcome is extended to the following who joined the Division during last November.

W.K.	(Wendy)	Anderson	VK2WAD	Castle Hill
P.C.	(Percival)	Bulliman	VK2TEN	Miller
R.	(Richard)	Close	VK2BRB	Wallsend
J.C.	(John)	Cowell	VK2MML	Mt. Pritchard
J.	(John)	Dudley	VK2MMF	Hazelbrook
P.J.	(Peter)	Ferrari	VK2BXQ	Tullamore
S.A.	(Stephen)	Knowles	VK2GVR	Milperra
G.	(George)	Pal	VK2PGA	Wollstonecraft
C.	(Claude)	Pradier	VK2CXC	Albury
R.	(Ronald)	Spain	Assoc	Toongabbie
R.A.	(Robert)	Stephenson	VK2KKN	North Sydney
P.D.	(Paul)	Thomas	VK2WPT	Tottenham
S.A.	(Scott)	Watson	VK2TAR	Bligh Park
A.H.	(Mick)	Wood	VK2VX	Frenchs Forest
L.	(Luigi)	Zilli	VK2TLL	Bossley Park

How's DX

Stephen Pall VK2PS PO Box 93 Dural NSW 2158

Happy New Year to you all. The material for this column was written on 24th of November, because of our peculiar Christmas Holiday "shut down" to reach you (hopefully) in the first week of January. The November issue of this magazine, with the news of the proposed shortening of the length of "How's DX?" column, was delivered to the readers between the 11th and the 17th of November, judging by comments read in letters since received, and heard over the air. The last ten days produced a number of letters, faxes and ten telephone calls. This number in my opinion is not adequate to give a true picture of the opinions of readers of this column. So if you care, voice your opinion immediately. The decision has to be made soon!

Lord Howe Island VK9L

Lord Howe, a sub-tropical island lying in the South Pacific is approximately 700 kms north-east of Sydney or 700 kms south-east of Brisbane, an airflight time of approximately two hours. The island was discovered in 1788 by Lt Henry Lidgbird Ball and it is part of NSW with a local Administration Board which looks after essential services on the island. The local population (under 300 people) has two sources of income; the well known Kentia palm which is exported to all the corners of the globe, and tourists, whose numbers are limited to a maximum of 400 at any one time. This limitation in numbers requires quite some advance planning from intending tourists and radio amateurs looking for an ideal DX-spot. This was the scene that Bill VK4CRR and Len VK4DDK found when they operated from Lord Howe from the 18th to the 25th of November. They had difficulty finding a place to stay as all accommodation was booked out until February 93, and most accommodation places do not want radio amateurs. I wonder why? Bill and Len operated under the callsign VK9LD and QSLing will be done by Bill VK4CRR, direct only, with SAE and return postage. No bureau cards will be accepted. Bill's address is; W Horner, 26 Iron Street, Gympie, Queensland 4570.

Cocos Island TI9

Cocos Island or Isla del Coco to give its proper Spanish name, is a rocky outcrop and lies 5 degrees 32 minutes North and 87 degrees 04 minutes West in the Pacific Ocean, and is part of Costa Rica.

Jose, TI2JJP and a group of helpers kept Cocos Island, TI9JJP on the air from the 1st to the 11th of November on all bands, mostly SSB with some RTTY and CW mixture. They were good copy in Sydney around 0417 UTC on the usual 14195 SSB DX band segment. QSLing direct only, to TI2AOC Cecilia Artinano de Pastora, Box 529, Centro Colon 1007, San Jose, Costa Rica. US$1 preferred for return postage.

Jordan JY40

His Majesty, Alhussein Ibn Talal, better known as King Hussein of Jordan, also known under his amateur callsign as JY1, celebrated his birthday on the 14th of November. The day marked also the 40th anniversary of his ascension to the throne of Jordan. To celebrate this double anniversary the Jordanian amateurs used the special prefix of JY40 followed by their individual suffix a number of days ending on the 20th of November. Zedan's net, JY3ZH on 14250 at 0500 was very busy with traffic from all over the world. At least a dozen JY40's were heard on the East coast of Australia. Those who want to obtain a commemorative diploma (minimum five contacts with JY40 stations) signed by the King himself, should send their QSL cards, application form and ten IRCs to the Royal Jordanian Radio Amateur Society, Box 2353, Amman, Jordan.

Saint Helena ZD7

Saint Helena, a small mountainous volcanic island in the Atlantic Ocean (15 degrees 57 minutes S, 5 degrees 42 minutes W) has a surface of 122 square kilometres with a population of about 5000 people. It is a British Island and the administration centre of other British Islands (ZD8 and ZD9) in the southern part of the Atlantic. Its only significant fame is that Napoleon Bonaparte lived here in exile for six years until his death in 1815. There is not much activity from the island, so it is always a challenge to work a ZD7 from VK when it pops up on the bands. Bill, VK4UA was instrumental of persuading Chuck, ZD7CRC to keep a lookout for the VKs and ZLs on 14153 SSB at around 0730 UTC in the early part of November. Chuck was a reasonable copy on the eastern part of VK for many days for the benefit of the Australians and New Zealanders. QSL to Chuck Chalmers, PO Box 126, St Helena Island, South Atlantic Ocean.

Pacific activity by Europeans

Quite a number of Europeans were island hopping in November and December and are still in the Pacific area this month. Mike, G4IUF was active from New Zealand (N6SVL/ZL), from Cook Islands (ZK1IF), American Samoa (KH8/N6SVL), Fiji (3D2UF), and Western Samoa, 5W1VL. Three former East German amateurs, Tom, Y31XO, Frank, Y32QD, Holger Y58IO, and (YL) Birgit Y58AO will tour Fiji (3D2), Solomon Islands (H44), New Caledonia (FK8), and Wallis Island (FW). They are using a homemade amplifier with a "no transformer" direct voltage doubling power supply. They might visit Tuvalu (T2), and/or Nauru (C2) before they return home at the end of January.

Karl, DL1VU was also on the move. His operating schedule looks something like this; T32VU (Christmas Is), KH5/DL1VU (Palmyra), T31AF (Canton Is), T30CT (Tarawa), T33VU (Banaba), C21NI (Nauru), V63VU (Kosrae), KC6/DL1VU, (Ponape), DU1/DL1VU (Manila). Most of his operation is in CW including WARC bands on the usual DX frequencies. Everyone contacted will receive a QSL card via the Bureau.

Hungarian DX Expedition to T31 and T33

Eli, HA9RE plans to go to Phoenix Island, Central Kiribati (T31), and Banaba (Ocean) Island T33 in January, February this year. This is his third trip to the Pacific. In December 1990 February 1991 he activated, in company of Miki (HA8XX), Chatham (ZL7), Niue (ZK2) and Cook Islands (ZK1). January to March 1992 saw activity from West Kiribati (T30) and from East Kiribati (T32). In the course of these two expeditions almost 100,000 contacts were made.

Future DX Activity

- Ken, WA4OBO is planning a second trip to Chad (TT8) in February or March.
- The proposed DXpedition to Palmyra Island (KH5) and Kingman Reef has been postponed until February.
- It has been reported that ZS7ANT is active in the Antarctic until mid-February.
- Bernhard, DF3ZJ, will be active as 9X5AB until August 1994. QSL via DL6NA or direct to Bernhard Ahlborn, BP 420, Kigali, Rwanda, Africa.
- There is a new operator at Crozet Island. FD1NOG will be active as FT4WD, but he is not an experienced DX operator. QSL to F6AXX.
- Jan Mayen Island should be heard during the northern winter with JX7DFA and JX3EX being active. QSL to LA5NM.

- HF0POL from the South Shetland Islands is very active mainly in CW on 3.5, 7, 14 and 28 MHz.
- It was announced on the air, that ZL2AHC is planning to go to Chatham Island (ZL7) in March 1993.

Interesting QSOs and QSL Information

Note: callsign, name, frequency, mode, UTC, month.

FY5FP, 14016, CW, 0940, Oct, QSL via Bureau.

TJ1GG, 14015, CW, 0630, Nov, QSL to I2EOW Ermino Pandocchi, Via Moretto da Brescia 40, 1-20133, Milano, Italy.

OD5/SP3LSE, Zenek, 14006, CW, 0653, Nov, QSL to SP7EJS Antoni Lichota, Box 82, 96-100, Skierniewice, Poland.

FG4FR, Franz, 14010, CW, 0511, Oct, QSL to FG5BG Georges Santtalikan, 44 Rue Amedee Fengarol, Brest, F-97130 Capesterre Belle Eau, France.

7X2VFK, Mohammed, 14243, SSB, 0658, Nov, QSL to PO Box 467, Djelfa, 17000, Algeria, Africa.

ZP5CGL, Laca, 14192, SSB, 0958, Nov, QSL to Bureau.

FY5FJ, Richard, 21205, SSB, 0441, Nov, QSL to IK2HTW Angelo Morello, PO Box 41, 1-21021, Angera, Italy.

OD5PL, 14252, SSB, 0703, Nov, QSL to HB9CRV Hermann Stein, Bruelmatten 13, CH-4410, Liestal, Switzerland.

YI1BGD, 14252, SSB, 0610, Nov, QSL to YJ3ZH Zedan Hussein, Box 11020, Amman, Jordan.

ZL7AMO, Ron, 21205, SSB, 0521, Nov, QSL to ZL1AMO, Ron W. Wright, 28 Chorley Ave., Massey, Henderson, Auckland, 1208, NZ.

W1GWN/KC4, Warren, 14159, SSB, 0955, Nov, QSL via the W1 QSL Bureau to home call.

From here and there and everywhere

- OD5ZZ was heard saying that there will be many new amateurs on the air soon, from Lebanon.
- Les, VK4DA advises that a letter sent to 5Z4FM to a Nairobi PO Box number was returned after 10 months, marked "insufficient address". However, the "greenstamp" was missing from the returned envelope.
- 7X2VFK was a special event station in Algeria commemorating the start of the Algerian revolution in 1954. The station was active from the 1st November to the 10th of November on 10 to 160 metres.
- There are still quite a number of amateurs who are waiting on cards from Romeo's Afghanistan, Myanmar, Spratly and other operations. Rumours abound about the incorrect QSL routes, alleged non-QSL managers, missing mail, missing contents of envelopes etc. Romeo has now sent a lengthy FAX to the "DX News Sheet" explaining some QSL routes. Here is a shortened version which applies mainly to VK/ZL stations. 1S0XV, 1S1RR (1990), 3W7A, 3W100HCM, XV100HCM, XV0SU cards go via W4FRU or Romeo's Bulgarian address. YA0RR (Dec 91), 1S0RR (Sept 91), XY0RR to the Bulgarian address; 9D0RR (Aug 92) via NT2X and all others, like EK0RR, MM, 3W3RR again to the Bulgarian address. Romeo has all the original logs. The American and Canadian operations of Romeo go via the W1 QSL Bureau. Romeo's Bulgarian address is PO Box 812, Sofia 1000, Bulgaria. Romeo says that the Sofia address is now absolutely secure. However in the distant past, a lot of envelopes (approx 2500) were "lost", and cannot be recovered. Romeo further says that he is not a member of the ex-USSR QSL Bureau (Box 88, Moscow) therefore the QSL route is direct only to the Bulgarian address. A "lot" of cards sent to various ex-USSR addresses were "lost" by postal workers.
- If you hear the beacon of the "Earthwind" balloon on 28303 kHz, send your SWL report to Richard, N8IWJ.
- NP2CG, Lee, was active from St Thomas, US Virgin Islands. QSL to WA2NHA.
- According to the 1992 most wanted DXCC Countries survey, conducted by "The DX Magazine" Peter 1 Island (3Y) is required by 67.8% of the DX-ers surveyed, and is ranking No 1 in the list. Bhutan A5 is required by 60.2% (No 2), Libya (5A) is required by 59.5% (No 3). How things have changed! Albania (ZA) is the last in the 100 most wanted countries list, required by only 6.9% of the DX-ers.
- JU830C is the special event station activated by the MRSF, (Mongolian Radio Sport Federation), celebrating the 830th anniversary of the birth of the ancient Mongolian Leader, Chingis Khan. QSL to JT1KAA.
- The validity and/or expiry date, or whether the IRC which bears the wording "surface mail" is valid for Air Mail, has been explained by Sandy, N7PQP, who is a US postal employee. Sandy says in "The DX Magazine" that every IRC issued after 1975 is valid and will be accepted for Air Mail postage in countries which are members of the Universal Postal Union.
- If you worked TL8NG, he is Gene, from the Central African Republic. He is active mostly on CW but he has been heard also on various nets on the 20 metres band. QSL via WA1ECA.
- It was quoted by G3KLL as heard from UC2AB as saying, that the UC2 (Byeloruss) outgoing QSL Bureau has closed down due to lack of funds.
- Ron, ZL1AMO was quite active as ZL7AMO mainly on CW, but showed up quite often on various SSB nets. QSL direct with return postage to home call.
- A number of Spanish amateurs received a one year special authorisation to operate on 6 metres with the EH prefix.
- If you heard VK8QQ operating portable from Bathurst Island, he was DF5UG.

The second "International Border Meeting" of radio amateurs took place on the 19/20th September in the Hungarian City of Sopron, near the Austrian, Slovak border. 550 amateurs attended from 9 countries. A number of topics were discussed dealing with VHF-UHF Satellite EME communications before many representatives of Europe and US visitors.

- One does not hear much of Mirek, VK2DXI. A quiet DX-er who since he left his native Poland in 1981, operated from many locations. Just to name a few: OE(81), DL(86), VK9N(87), 9V1(87), 8Q7(88), BY1PK(88), SM5(90), VE(90-91), W(KH6, 90-91), VP5(90), SO5(91), 9M2(91), 9M8(91), 9N1(92), VU2(92). Mirek operates mainly CW and is an avid contester. (See December "AR"). Starting with the 9N1 activity, he asks that all cards are to be sent to his new QSL manager, DL4DBR Ted Barczyk, Pappelstr. 34, W-5800, Hagen 1, Germany.

QSLs Received

Note: There was quite an interesting selection to report on. However, this article is already too long, so I decided not to publish the list this month. For the same reason, there is no DX related photograph is this month's column. If you miss them, then please write me a few lines.

Thank you

Many thanks to:- VK2CSZ, VK2DID, VK2DX1, VK2KFU, VK4CRR, VK4DA, VK4DDK, VK4OH, JY3ZH, HA5BSW, HA5HR, HA9RE, and the following publications: QRZ DX, The DX Bulletin and the DX News Sheet.

Good DX and 73

ar

Murphy's Corner

November Issue 1992
Article — Morse Trainer for GW Basic, Page 12

A few errors crept in the typing:

1. Line 60 contains 8 characters too many in the underlining.
2. Line 110, the word 'Enter' should be between single quotes, not double.
3. Line 320, the x symbol should be a ⟨ (less than symbol). This line should read; 320 IF K ⟨ KK THEN 250

Production Editor's Note — We tested the program on the WIA IBM compatible computers and it works very well. If any member would like a copy on disk (to save typing), we can provide same on receipt of a formatted floppy disk (IBM format, 9cm or 13cm) and a SASE, alternatively send $5-00 to cover postage and the disk to me at the WIA Federal Office, PO Box 300, Caulfield South Vic 3162. Please allow a few days for turn-a-round .... VK3UV.

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets the passing of :

L H (Leo)	McMahon	VK2AC
B	Ronald	VK2EHR
H T (Hugh)	Tolhurst	VK2GOS
R L J (Rob)	Warren	VK3CRW
J D (John)	Sweeney	VK3IH
J K (John)	Pollard	VK3QZ
N A (Norman)	Richardson	VK4BHJ
M J	Stinson	VK4DD
S (Stefan)	Demchenko	VK6UC

Bernie Gates VK6KJ

The many friends of Bernie Gates VK6KJ will be saddened to hear of his passing on Friday 6th November 1992 at the age of 76 years.

Bernie had been in indifferent health for some years, but the final illness lasted only a few weeks during which time he was confined to bed.

Bernie was active on the HF bands for over 40 years, working his scheds on 80, 40 and 20 metres almost to the time of his passing. Many VK5 and VK3 amateurs will remember him for his proving the VHF path between VK6 and the southern states in the 60s and 70s, when he worked many stations over the Bight on two metres.

Communication was Bernie's life. Even when he was confined to bed at the last, he kept in touch with his friends on the 40 metres "Shavers" Net" via a two metre link and his Barlow-Wadley receiver.

Bernie will be remembered also by the many who were given willing assistance by him over the years. He will be missed.

We extend our sympathy and best wishes to Jean, his XYL, and Jenny and Kim, his family.

Bob Elms VK6BE

Norm Richardson VK4BHJ

Norm was a traditional reticent English gentleman with a lifelong interest in radio and shortwave listening.

During WWII he served in the English Army intercepting coded German traffic which was deciphered at the noted Bletchley Park signal centre. Serving later in the Malayan crisis, listening through heavy atmospheric noise impaired his hearing, though he could copy 35 WPM on a typewriter.

Fortunately for Amateur Radio, Norm also gained a passion for detecting weak signals, and more importantly, locating their origin.

He was a member of RSGB for many years, and in his early 70s left England and joined his son in Mt Isa. After a couple of years there, he and his wife moved to Everton Park where Norm became involved again in monitoring. The WIAQ appreciated his skills by awarding him the WIA 75th

Anniversary Medallion and Certificates of Merit in 1986 and 1991, for being one of the most effective Intruder Watchers in Australia.

Norm was 86 when he died of a sudden stroke on 6th November 1992, leaving a large gap in the ranks of the few Intruder Watchers.

Our sincere sympathy goes to his wife Rose, and family.

Col VK4AKX
Guy VK4ZXZ
Tom VK4BTW

Hugh Tolhurst VK2GOS

I regret to advise the sudden death on Monday 23rd November 1992 of Hugh Tolhurst, VK2GOS, Secretary/Treasurer of the Great Lakes Radio Club Incorporated. Hugh was aged 70 years.

Whilst out cycling in the early morning, he suffered a massive heart attack which took his life before medical assistance could arrive.

Hugh, who obtained his full call only last year, embraced amateur radio with all the enthusiasm which characterised his other loves of golf and photography.

The deepest sympathy of his many friends goes to his wife Rosemary, and his family. The world is poorer for his passing.

Stan Ellis VK2DDL
President
Great Lakes Radio Club Inc

John Kenneth Pollard VK3QZ/VK3TCK

John Pollard became a Silent Key at home while preparing to work on his antenna. He had a heart attack on the 11th November 1992 at age 61.

I first met John in 1988 when after studying for his novice licence with VK3BSM of the Eastern Zone, he wished to further his theory to the full call. He joined a course I was running at the time. He successfully passed his full call and got the callsign VK3QZ from Graham Colley when he moved to Queensland.

John originally came from England and migrated to Australia in 1973 worked as a Civil Engineer on several jobs before moving into the VK3 Eastern Zone in 1985 to work on the Loy Yang Power Station project. His interest in radio started in CB and then he went on to amateur radio as above.

During his time as an amateur he was a great ambassador for his adopted home, he regularly collected local literature from the Latrobe Regional Commission for inclusion with his QSL cards. He made several major trips around VK visiting people he had met on air, and in 1991 he made the local news for his contact with Kuwait during the Middle East war.

John was a great person and a credit to the amateur radio world. His quick wit and jokes will be missed on the airwaves. Sincere sympathy to Shirley and family.

Tom Corrigan VK3XBG
ar

Over to You — Members Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Thanks for AR7

I wish to put on record my sincere thanks to all those who responded to my "Wanted Vic" advertisement in the September issue of AR. The advertisement asked for help in providing a "Kingsley" AR7 receiver for the Scienceworks (Museum of Victoria) collection of Australian designs and inventions.

The response was wonderful with the result that a fully operational, up to specification AR7 complete with power pack, speaker and rack was handed over on Wednesday 25th November. A very pleasing feature of the operation was that everything used was a cost free donation.

The unit will be on display until at least the end of July 1993.

The full story will appear in a later issue of AR.

Thanks again everyone.

Allan Doble VK3AMD

Re Gavin Douglas VK3YK (Silent Key)

At the funeral of my father, Gavin Douglas VK3YK on 9th November 1992, there were a number of radio hams present that I did not know, and as a result of confusion on my part and also of the rain, I was not able to speak to all of those present.

I wonder if you would be so kind as to pass on my appreciation and thanks to all those people for me.

The radio played a very important part in Dad's life, and it was wonderful to know that so many of his friends were there. Over the years I know he enjoyed the friendship and interest of many people, whether they were regular contacts or occasional when conditions were favourable.

In later years, I think the contact with yachtsmen and women was a particular interest as he had sailed as a young man. He also enjoyed the travellers net, and most recently enjoyed the friendship and support of the VK3UE net.

I really would be most grateful if you could pass on the thanks and appreciation of myself and my brothers.

Sincerely, Ann Phillips
ar

"Operating marine mobile. We run a tight ship here."

A Packet of Packet

Kevin Olds VK1OK 238 Southern Cross Drive Latham ACT 2615

Although a little bit later than anticipated, we finally have the next instalment in the packet column. Already I have started to receive some feedback on the first column which is most encouraging. More would be welcome however. If all goes well we may see something in this column on almost a monthly basis, with items split between basic material for the would-be or novice packeteer and items for those more experienced in the packet world. Interspersed will be some more general interest items which may stir the interest of a few more to try packet. Packet is more than just Bulletin Board Systems, it has a breadth of interest all of its own. For this months" column I am indebted to Warren Toomey, VK1XWT for the use of his item on "Wormholes — the Last 12 Months" which he presented to the CAPRG Technical Symposium in September 1992. Now over to Warren.

What Is a Wormhole?

A wormhole is a machine connected to both the amateur radio network (via a transceiver) and another network, and uses this network to transparently pass packet radio packets. In other words, the wormhole is using the second network as a medium for packet transmission. With several wormholes connected by a network, amateur packets can be forwarded over very long distances. Here in Australia, the wormholes are using the Australian Academic Research Network (AARNet) to forward packets. AARNet is a very high bandwidth network that extends across the continent, with AARNet sites at all major academic institutions. AARNet itself forms part of the Internet, a large academic network which runs throughout America, Europe, Canada and Japan. The wormholes use the Internet as a carrier of packets, in a way that prevents the amateurs from accessing the Internet and vice versa.

Wormhole Growth

In the last 12 months, wormholes have proliferated. Around August 1991, there were about a dozen wormholes. Now there are well over thirty, most of which are in America; the rest mainly in Canada, Europe and here. The sole Australian wormhole in 1991 in Canberra has now been joined by wormholes in Brisbane, Newcastle, Sydney and Melbourne. Even more gratifying, the number of ordinary packeteers using these wormholes has increased as well.

Wormhole Services

The wormholes are usually made of computers running the NOS program, written by Phil Karn KA9Q, Gerard van der Grinten PA0GRI, Johan Reinalda WG7J and others. NOS provides normal AX.25 services, NETROM, and TCP/IP networking. Thus, the wormholes can forward many different types of amateur radio packets, not just the TCP/IP ones. Indeed, much of the wormhole traffic is either forwarding of bulletin board items via AX.25, or users exploring the NETROM nodes. However, as well as the packet forwarding services, many of the wormholes provide a wide range of user services. These include bulletin boards, binary and text file repositories available using a file transfer service, and personal mail service. These services are designed to bring the network to you, rather than the other way around — this decreases the load on the whole network, and localises the network traffic. For example, the wormhole in Canberra offers over 10 Megabytes of amateur information and programs to the local community. These are also available to all the other users who can connect in via the wormholes.

New Wormhole Services

1992 has seen the refinement of an existing service, POP, and the arrival (in a big way) of a new service, Converse. POP is a personal mail server. Instead of having to leave your own TNC/computer running 24 hours a day, you obtain a mail account on the POP server. The POP server then collects your mail for you, and you can log in at intervals, and review/read your mail. This sort of service has been traditionally provided by bulletin boards, but POP has some advantages: it can collect mail from both AX.25 users and TCP/IP users, and a separate POP service takes the load off the bulletin board, leaving the latter to work solely on bulletins. The Converse service, however, is the biggest service to take off in 1992. If you have seen a DX Cluster, then you will know what Converse is like — a multi-person QSO. However, with the wormholes, the QSO is now global; nearly every day the Converse chat spans three continents: Australia, North America and Europe. Over a dozen wormholes support Converse. The nice thing about the Converse service is that it is all handled transparently for you. To join the conversation, you connect to your local Converse service -- you are instantly connected to the rest of the available Converse servers. And the service is optimised to only broadcast your packets to those servers that have active users; if a Converse server has no users, it receives no packets. Converse also has over 32,000 "channels", allowing you to move off to an unused channel if you only want to QSO with a few people, or on a particular topic.

NETROM/AX.25 Parameter Standardisation

Because the wormholes forward not only TCP/IP packets, but AX.25 and NETROM packets, it was found necessary to standardise on the parameters controlling their exchange, especially for NETROM and its routing tables. The parameters used by the VK2 and VK3 wormholes (eg NETROM timers of 1800 and AX.25 link quality of 252) have been accepted and are now being used by the other wormholes, and other NETROM nodes as well.

Internet Access by Amateurs

Not only is the Internet a fast way of forwarding amateur packets, it provides a wealth of programs and information to its normal users -- so much so that it can sometimes appear daunting! Early on in 1992,

there was a push to somehow make the resources of the Internet available to amateurs. This was done by having the amateur TCP/IP network (44.x.x.x) advertised to the whole of the Internet, and having one wormhole act as a gateway between the two. This proposal is a double-edged sword, as it allows amateur and non-amateur machines to communicate, which can in some cases be illegal. To prevent any sort of legal problems, the latest software used on the wormholes prevents Internet machines from connecting to amateur machines, while still allowing connections in the other direction. Thus, amateurs can access the services of the Internet, but not vice versa.

The Future

1992 has seen more wormholes appear, with more services provided by these wormholes. At the same time, the wormhole operation has matured, providing more reliable service to their users. Who knows what the future will bring? However, I'd like to see the concept of bringing services to the user expanded, for the reasons stated above: to ease the load on the wide-area networks, and to speed up response time for the users. However, provision for two-way or multi-way conversations should not be ignored. Wormholes provide a fast and relatively cheap way of packet radio intercommunication over large distances, but I believe it's now time to start thinking about our own long-distance networks, as the wormholes are really not amateur radio, and we have no idea how long the gravy train will last. At the same time, the cost of even 9.6Kbps amateur connections is large, let alone 56Kbps. We should realise that although wormholes are not what we really want, they are there now and we may as well use their services until we can create our own. Finally, 1993 should see the relaxation of the laws governing amateur radio and packet radio operation in particular. It seems appropriate at this time to call for an end to the "protocol wars" that have plagued us over the past few years. We must realise that no one packet protocol is going to suit us all, and we should be tolerant of all protocols that amateurs use. As the regulations relax, I would like to see the development of new, experimental protocols (such as the PACSAT broadcast protocol) to make better use of our bandwidth. Thus, let us use the wormholes as an example for our future where multiple protocols are actively or passively supported, and network protocols and applications are designed to make best use of our frequencies. I hope we all can benefit from the resources provided by the wormholes, and at the same time I hope we can start the design of an amateur network that will make them obsolete.

If this has inspired you to want to start your own wormhole, please write to me first — several potential Australian wormholes did not eventuate due to the approaches made to AARNet institutions. For more information, please send some mail with details of your proposal to:

Warren Toomey
Department of Computer Science
University College, ADFA.
Canberra, ACT. 2600.

ar

Pounding Brass

Gilbert Griffith VK3CQ 7 Church Street Bright Vic 3741

A Little More History of the Telegraph

Last month we left the five colonies of Western Australia, South Australia, Victoria, New South Wales and Queensland connected together by telegraph on 8th December 1877. Prior to this date was the completion of the most famous of endeavours by Charles Todd in 1872. The Overland Telegraph Line successfully linked Australia with the outside world for the first time. In January 1870 the government was informed by the British Telegraph Company that an undersea telegraph line would be brought ashore at Port Darwin. The original intention was to link up to the Queensland telegraph network at Burketown but Todd convinced the government that in eighteen months he could build a line from Adelaide to Darwin.

Those of us who have driven across the centre will have some idea of the trials that the overlanders would have experienced. The formidable and unknown country had previously been crossed only once by Stuart in 1862 (ten years previously), and had already claimed the lives of other explorers such as Burke and Wills as well as Leichhardt and his party. John Ross and his overlanders had to explore a route with the telegraph line in mind, meaning they had to map sources of timber and water for the following parties, as well as suitable trees for poles.

The northern section was supplied by ship from Adelaide to Port Darwin (via the East coast!) with no wharf or jetty available at Darwin. Animal losses were around 30% and even more. At the Roper River depot (96 miles up river) crocodiles would lie in wait for horses coming in for an evening drink at the river.

Despite monsoon weather and losses of stock and machinery in mud holes, the line heading south from Darwin was raised, only to have the poles condemned shortly thereafter due to termites. This necessitated the importation of iron poles from Britain for the affected sections.

It is difficult to imagine the hardships that would have been endured for a wage of 20 shillings a week with 3 pairs of jeans or moleskins, 3 of boots, rifle, ammunition, 2 hats, belts, knives, pipes and tobacco for perks. In those days it might have been a very attractive wage despite the hardships. These days we are used to the convenience of fast and comfortable transport, power tools and so forth. It is essential to remember that all poles had to be cut by hand and the holes dug using special long- handled shovels to get the required depth of four feet. Then it was necessary to climb the pole each time to drive in the spikes for the insulators and again to install the wire, and all this in temperatures that would, these days, keep most tourists confined to their air-conditioned cars or coaches.

Not only did the telegraph network make overseas trading easier and stimulate commerce, but the fact that the overland telegraph itself was successfully completed removed much of the worry and stress from those who thought that the project would bankrupt the colony of South Australia. Real time transactions were now possible, and even clocks could be accurately set around the country. By 1900 telegraph lines in Australia covered 20,000 miles, with telephones being tried over some telegraph circuits. At the same time radio experiments were being carried out in Sydney. A mere 10 years later the Wireless Institute of New South Wales was formed.

ar

Repeater Link

Will Mc Ghie 21 Waterloo Crescent, Lesmurdie 6076 VK6UU @VK6BBS

This month's Repeater Link has been produced by Will Scott VK4XP. Will (this could become confusing) has already written one article for Repeater Link and has followed it up with a simple in-band link controller. Will's previous article on categorising the various methods of linking resulted in comments from readers on some systems used in Australia. Some are variations on the basic systems as described by Will.

One such system is in operation in South Australia. The Barossa Valley ARC have set up a "satellite link repeater" system to extend the coverage of their VK5RBV voice repeater. What they have is a "simplex" repeater on 147.825. Users of the link transmit and receive on the same frequency, 147.825. The satellite link repeater receives the 147.825 signal and re-transmits it on 146.225 to repeater VK5RBV in Adelaide. The reverse happens with VK5RBV's signal being received by the simplex repeater and re-transmitted on 147.825. This simplex link repeater has the callsign VK5RBG and consists of two receivers and two transmitters.

Where there was no access to VK5RBV now there is via VK5RBG on 147.825, into Adelaide. My thanks to Grant VK5ZWI who supplied the information. The following is from Will Scott VK4XP.

Simple In-band Link Controller

Do you need to link one repeater to another ? Do you want to use the simplest and cheapest method? Here is a proven method for linking two repeaters together using only one extra transceiver and a controller.

Where can it be used?

This method has been used for several years now for the link from the Miriam Vale repeater on 7625 to the Bundaberg repeater on 6800. Miriam Vale is about 150 km north of Bundaberg and about 70 km south of Gladstone. The stretch between Gladstone and Bundaberg is very long and, except for one or two small towns, is virtually unpopulated.

Miriam Vale repeater was installed to cover this area and as there are no local radio amateurs in the service area, it was decided to link it to Bundaberg's 6800 repeater permanently.

Motoring radio amateurs now enjoy good coverage between Gladstone and Bundaberg with the associated company a repeater can bring along the way. Naturally, this improves the safety coverage in this area as well.

Imagine you are about to conduct a WICEN exercise in a repeater dead spot. What about a local repeater with a link to the main repeater? Something that can be set up quickly and easily.

If you have a similar situation which does not require a repeater link with any switching or fancy controls, then this controller may suit you.

How does it work?

All repeaters feed received audio from their receiver into the microphone circuit of the transmitter. As well, when the mute relay opens on the receiver (the Carrier Operated relay or COR), the transmitter Press to Talk (PTT) is operated.

A transmitter timer is included to limit the maximum time the PTT is operated. Also a timer is placed onto the COR so that when the received signal stops, the COR continues to operate for a short period afterwards. This causes a tail to appear on the transmitter of the repeater.

Ident signals may also be connected if required into the COR/PTT circuit and the microphone input circuit. Whilst provision is made on this controller for an ident, it is not described in this article.

Fig 1 shows a block diagram of how the controller is wired into the repeater and the link transceiver. This set up is used only on one end of the link. The transceiver is tuned to the distant repeater's frequency. This makes it an in-band link. No changes need to be made to the distant repeater.

The link transceiver connects into the controller as well as the transmitter and receiver of the repeater. It is wired so that when the COR opens on the repeater receiver, it operates both the transmitter's PTT and the link transceiver's PTT. A tail is applied only to the repeater's transmitter not the link transceiver. If it were applied to the link, a double tail would appear on the distant repeater.

The link transceiver's COR is also connected to the repeater's transmitter so that either the repeater's receiver or the link transceiver will key the local repeater's PTT.

Repeater circuit

Please refer to Fig 2 to work through this explanation. The repeater's receiver operates its COR into PIN 1. The signal is inverted with IC1 and passes through the tail circuit, D1, R2 and C1. Capacitor C1, nominally a 10 μf, controls the tail length for the repeater. This is usually set to about 600 ms.

The signal then passes through the OR gate of IC1 pin 8 and on to the connection for the optional ident. Diode D4 allows an OR function if the ident option is included. Otherwise components D4, R3 and C2 may be omitted.

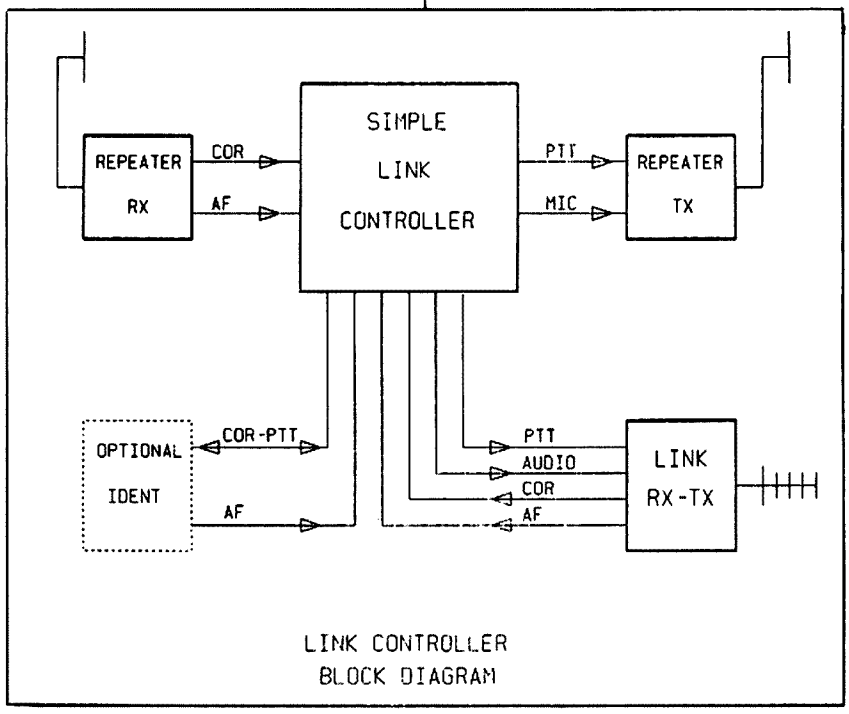


FIGURE 1

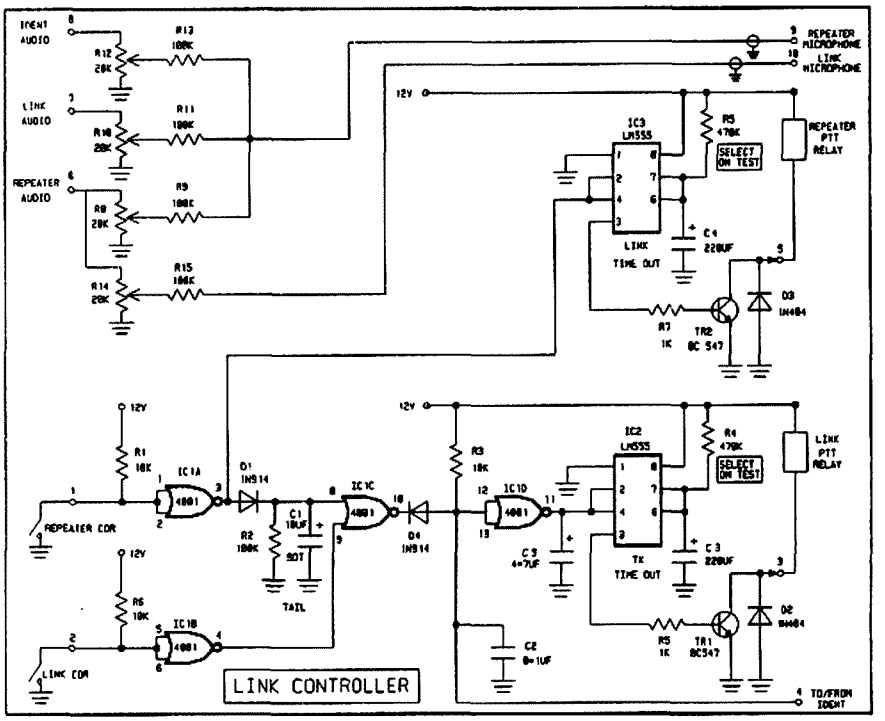


FIGURE 2

The signal is finally inverted again for correct sense and fed to the repeater timeout timer IC2, a 555 timer and its associated components. The output from the timer drives a buffer/inverter transistor which is used to key the PTT relay in the repeater's transmitter via pin 4. The transmitter timer is set by varying R4, nominally a 470K.

Usually the repeater has a timeout of three minutes. However, it is important that both the link timeout, described below, and the repeater timeout are set to exactly the same value.

This ensures that a conversation is not stopped on one repeater and continuing on the other, with confusion and much embarrassment.

Audio frequency (AF) from the receiver is fed into pin 6 of the controller. It is controlled by R8 then mixed with link AF from pin 7 and the optional ident from pin 8 through resistors R9, R11 and R13. Finally this is fed into the microphone circuit of the repeater's transmitter from pin 9.

Audio quality is important. Audio should be derived from as close as possible to the receiver's discriminator, but after the mute gate. As the level of the signal at this point may be low, it may be necessary to vary R9 and R11 to obtain the correct level for good deviation into the transmitter.

Similarly, the AF feed into the transmitter should be wired into a point after microphone pre-amplification, pre-emphasis and compression to maintain quality.

As an absolute last resort, audio may be tapped across the receiver's speaker and after mixing in the level control, fed into the microphone input direct. The result may be that the link works but the audio quality will be poor.

This describes the repeater control circuit. It may, in fact be used to control any repeater without further modification.

Link Circuit

The link transceiver's COR is fed into the controller on pin 2, inverted by IC1 and then ORed with the repeater's COR on pin 9 of IC1. You will notice the link COR is fed into the repeater's transmitter timer after the tail. So the tail on the repeater, when the signal is from the link, comes from the distant repeater.

Likewise, the signal fed to the timeout timer, IC3 comes from before the tail circuit — from IC1 pin 3. The timer is similar to the transmitter timeout timer and drives the link PTT circuit via TR2, an interface transistor.

Audio from the repeater's receiver is picked off using R14 and fed via a level limiting resistor, R15, to the link transmitter microphone input from pin 10 on the controller.

Once again, care must be taken in choosing the correct tapping and injection points for the audio in the link transceiver.

Ident

An optional ident may be connected as shown to pin 4 for both COR and PTT and to pin 8 for audio. A future article will describe a ROM based ident module.

One feature of the controller is that the ident, if fitted, only appears on the local repeater. It does not appear on the distant repeater. This is achieved by keying only the repeater transmitter's PTT during idents and by feeding the ident AF to the repeater's transmitter only. The ident AF does not go to the link transceiver, because the path back through R9 and R8 results in very high attenuation.

The control circuit may be built with all ident components included and the ident simply plugged in later.

Construction

The controller may be built up on veroboard. It is not critical. Power should be 12V, fused with a 500 mA fuse. The zero volt side of the power supply should be grounded to the chassis, along with pin 12 of the controller.

Use shielded audio cable for AF connections.

Be sure to construct the unit well using a metal box for RF shielding. Take care with soldering and bolt things down well. Use good quality components and IC sockets where possible. You want this unit to be reliable. A service trip to a repeater to solder a dry joint can be very expensive and time consuming. Time spent now in good construction is built in insurance for the future.

Testing and Set-up

Now finally you have built up the controller and are ready to test it.

Firstly, resist the temptation to just turn it on. Thoroughly check the circuit and ensure the resistance between pin 11, 12VDC, and pin 12, Ground, is at least a hundred ohms. If not, something is wrong, so check your wiring.

Test the controller by itself by connecting switches to ground from pin 1 and pin 2 to simulate COR inputs and relays to pins 3 and 5 to simulate PTTs. Leave the COR switches open. Power up! The relays may click but return to a relaxed state. Check the DC current into the controller. Depending on the relays used, current should be well below 250 mA. The unit without relays should draw between 20 and 50 mA.

Now operate the receiver COR. This simulates a signal being received on the main repeater. Both PTT relays should operate. If they don't, investigate why. Usually it will be a wiring error.

With the receiver COR off, switch the link COR on. This simulates a signal coming in from the distant repeater. Only the repeater's transceiver relay should operate.

Now, leaving the link COR on, turn on the repeater receiver's COR. The link relay should now operate while the transmitter

relay still holds in. This represents a station on the repeater breaking into the distant repeater's tail. Turn all COR's off.

Now for the timeout checks. Operate the receiver's COR and time the period for the transmitter's relay to drop out. It should be about 3 minutes. Also look out for the link PTT relay drop out. It should be within 2 seconds of the repeater transmitter's drop out. Adjust R4 to get the repeater transmitter right and R5 for the link. The timeout is reset by switching the receiver's COR off momentarily. Make sure both timeouts occur within 2 seconds of each other.

Finally test the tail of the repeater by operating the repeater's COR and timing the transmitter relay dropout. Adjust for about 600mS by changing CI.

Radio Set up

The connections to the radios should now be made. It is good practice to use plugs and sockets so the radios can easily be disconnected for service and testing.

If the repeater was previously in service, the new controller replaces the existing one.

The first step is to fully test out the radios themselves. Make sure they are 100% on both receive and transmit.

Connect the radios into dummy loads. The mutes on both receivers should be closed. Now connect up the power to all units and switch on.

Next open the repeater receiver's mute and the COR should operate. Both transmitters should operate. Close the mute.

Now try the link mute. Only the repeater's transmitter should operate. Close the link mute to clear its COR.

Next open the link mute again, note the repeater's transmitter should operate, then open the repeater receiver's mute. This should cause the link transmitter to come on and the repeater's transmitter to remain on. Close all mutes and all transmitters should go off.

If you have not got this right you cannot proceed further. Once again check the wiring and connections.

Audio Set-Up

Now to set up the audio. Set the correct deviation on both transmitters by using their local microphones. Usually it is 7.5 kHz peak for amateur operation. Normal speech should top about 5.5 to 6 kHz.

Next a 1000 Hz modulated RF signal set to about 50 μV should be fed into the repeater's receiver. It should be deviated to about 4.5 kHz at the generator.

Both transmitters should operate as soon as the signal is applied to the receiver. Meter the level on both transmitters and set them also to 4.5 kHz for the link. If the levels cannot be set correctly, adjust R9 and R15 respectively. These two resistors should be set up so that R8 and R14 are at mid range.

Watch transmitter time outs while setting up the audio. Just drop off the signal generator momentarily to reset them.

Now feed a signal into the link receiver. This time adjust R10 for correct level into repeater's transmitter. Resistor R11 is the coarse tune for this pot.

Go back and check the repeater's receiver level to the transmitters again as interaction may be occurring between pots.

The repeater and link are now ready for burn-in testing.

Burn-in testing

A repeater and link should be reliable. An excellent way to check this is to leave the equipment running for several weeks connected up for general use. Naturally this is best done in town before taking it up onto the mountain.

Before final installation you should take some system measurements including power drain, transmitter and receiver operation, timeouts, tail lengths and so on.

Final Installation

When installing in-band repeater linking watch out for desense of receivers by transmitters close by. This is particularly important when the distant repeater is also on the same band as the repeater with the link equipment. If problems occur, try positioning the link antenna away from the repeater antennas. As well use directional antennas pointed 90 degrees apart if possible, first on the link and then if practical on the repeater.

Reducing the link transceiver power output and possibly the link receiver sensitivity often helps. A good link can work on 1 watt if the signals from the distant repeater are S9 or more.

Sometimes interfering RF is passed through the power supply from one radio to another. Make sure your supply is well filtered or operate with independent power supplies.

If the interference persists try physically separating the radios themselves. Also, make sure the earthing between the radios and controller is solid.

Operation

You will find that once installed, your linked repeater system will behave as one. Usually stations will not even know they are linked. Suddenly the coverage of your repeater is doubled.

Any station that calls on one repeater will automatically appear on the other and vice versa. Operators will not need special training to use the link. They simply use either repeater as normal.

After constructing this unit and building your link you may wonder what all the fuss was about with linking repeaters.

ar

Spotlight on SWLing

Robin L Harwood VK7RH 52 Connaught Crescent West Launceston Tas 7250

1993 has arrived and what surprises has this year to offer? It's impossible to say, but a recent symposium at the VOA in Washington DC, stated that shortwave broadcasting will be continuing, particularly as the technology isn't as advanced in the developing world with the economic costs of acquiring it beyond the reach of many. This symposium was sponsored by the United States Information Agency — the parent organisation of the VOA and allowed many broadcasters to share their views regarding the future of shortwave radio towards the 21st Century.

In the past three years, satellite based systems for delivery of programming have dramatically increased, particularly in Europe and many broadcasters such as DW and Austria Radio International frequently mention the transponders in use. These transponders are designed for rebroadcasting , primarily by cable systems and/or diplomatic missions yet there are an increasing number of private listeners complete with their own decoding equipment to add to their dishes. These are mainly found in Europe with some in North America, yet these can be numbered in the low thousands, compared to the millions who still use shortwave radio in these target areas.

Broadcasters such as the BBC External Services have done serious market research on what their audiences expect and require from their broadcasters. However others are still continuing with programming from domestic sources or have a narrow operational base that doesn't relate to what the audience wants. The largest audiences so far are in West Africa, the Indian subcontinent, China and the CIS nations compared to the North American audience which is one of the smallest. The trend to establish a MW or FM relay within the target area is increasing with many internation-

al stations now easily heard in many major European capitals.

While on that point, I notice that the BBC World Service is now available on a sub-carrier of two public broadcasters in Melbourne and Sydney. This 24 hours a day service will be on a subscription basis with a special decoder being on loan from the BBC. A program guide is also provided.For further details contact the Australian office of the BBC World Service, Suite 101, 80 William Street, East Sydney NSW. Telephone (02) 331 7744. The subscription is around $150 annually, I believe.

On the 23rd of October last year, a special transmission was heard in Australia by some shortwave enthusiasts. It came from the remote Atlantic island of St Helena, which is known from the history books as the place where Napoleon Bonaparte was sent into exile and died. A sender of Cable & Wireless was utilised for the two hour transmission in English around the local sunrise here in eastern Australia. The frequency varied but was approximately 11092 USB. Many DXers called the station on the phone and via fax. Sadly though, I unfortunately missed out as I'm still plagued by the PLL on my ICOM R70 unlocking at the most inconvenient times.

Standard Frequency and Time Station-VNG has now added another channel to its services. It is now on 2.5 MHz as well as 5 MHz, and from 2200 to 1000 UTC on 16 MHz. There is a talking clock plus an identification announcement given every 15 minutes. VNG, which is based at the CAA HF site in Llandilo NSW, also operates on 8.638 MHz and 12.984 MHz, which are on loan from the Royal Australian Navy. Identification is given on A1A and not on voice, although you can faintly hear the voice announcements.

Well, that is all for this month. Just a reminder, you can now leave messages for me on packet addressed as follows :- VK7RH @ VK7BBS Launceston TAS. AUS. OC.

Until next time, the best of 73 — Robin L Harwood VK7RH.

ar

VHF/UHF An Expanding World

Eric Jamieson VK5LP PO Box 169 Meningie South Australia 5264

All times are UTC

Six metres

Rather surprisingly, six metres has been relatively quiet, with a little F2 propagation and a small amount of Es. 28/10: 0030 VK4BRG and VK4JH, 0330 JAs and VK2QF worked HL9UH, 2310 VK4WTN 5x9. Through November, mainly VK4s and JAs.

Via F2, Steve VK6PA on I/11 from 0830 worked 9H1BT, 9H5ET, 9H1PA, 9H1ET and 9H1AZ, the latter transmitting 10 watts! During the 40 minute opening signals varied from S3 to S9. No other signals were heard. On 11/11 at 0900 Steve VK3OT had a rare opening to Europe when he worked PE1JKW at 539. This was 12 months after a similar opening. 19/11: 0040 VK4JH, 0500 pagers to 40 MHz, 0605 VK4BRG who said he had earlier worked K6MYC/KH6 as did stations in Brisbane. During the week ending 20/11 six metres operation in VK5 was frequently interrupted by thunderstorms appearing most afternoons.

Graham VK6RO said that on 20/10 he worked HL9UH and JAs were strong in Perth on 7/11 and 8/11. John VK4ZJB worked T30JH on 2/11 and reported that ZLs had worked W on 30/10. From time to time brief Es openings have occurred from VK3 and VK5 to VK4, sometimes lasting only a minute. The Toowoomba Channel 0 transmitter is occasionally heard strongly and has been noted in Europe.

Ron VK4BRG writes that it has been very quiet at Sarina, no new countries worked. Isolated very strong TEP openings to JA and KH6. Only other items in log are HL9UH on 26/9, T30JH on 29/9 and 2/11, NI6E and KH6IAA at 0237 on 15/11.

Joe VK7JG sent his Six Metres Standing List upgrade and advised that pressure of work kept him off six metres for much of Cycle 22. Also, during that time, a shack rebuild was necessary, including the construction of a 45 foot (14 m) tilt-over tower, but not all aerials are attached. He hopes to have his 1296 MHz gear again operational this summer.

Joe also advises that after 12 years operation, the six metre beacon VK7RNT, is to be closed down for the time being, having served its useful purpose. It may be reinstalled in the future from a common site with beacons on 144, 432 and 1296 MHz. Details later.

Recently, Joe built an RF link to connect VK7RAB 438.55 repeater in northern Tasmania to VK7RAF 147.250 in the south. Amateurs in Launceston can now communicate with Hobart using a handheld rig. The link is activated by using a sub-tone of 250.3 Hz, selected because no modifications were necessary to the repeaters and the tone could pass through a repeater with little attenuation.

Bangladesh

Special mention should be made of the contact between Rex VK8RH and S21ZE in Bangladesh at 1405 on 11/10/92. Apprently Andy VK8AH was the first to hear the station, at 1400, of the dx-pedition mounted by two Japanese stations, but was unable to complete a contact due to low power and a small antenna.

Andy advised Rex who has a larger station and a two-way CW QSO resulted, giving him the first ever VK to S21 contact. Good work gentlemen.

Scott Watson VK2JSR/VK4JSR writes enclosing a packet message from Ken JA3EGE which lists the various Spanish stations authorised to use 50 MHz. Briefly there are 17 in EH1, 5 EH2, 24 EH3, 6 EH4, 5 EH5, 16 EH7, all these being in Spain itself, 5 EH6 on Balearic Island, EH8ACW on Canary Island and EH9IB and EH9HM Ceuta and Melilla; so it is possible to work four countries with the EH prefix. This information may not now help VK stations but could interest overseas stations.

MD5KW

Dave ZL1AFQ has written regarding my query on the callsign MD5KW and drew my attention to a reference on the matter in John Clarricoats (G6CL) book World At Their Fingertips. John reports on the first two-way Transatlantic contact on 50 Mc/s between Ed Tilton W1HDQ and Denis Heightman G6DH on 5 November 1947, and then goes on to say that two days later Heightman made contact on 50 Mc/s with Major Ken Ellis, G5KW, then operating as MD5KW from the Suez Canal Zone — the first contact between the UK and this area. Minutes later Ellis worked E J Laker, G6LK and W.E. Russell, G5WP — both located in Surrey. So the first contacts associated with MD5KW have been tabulated in Australia and I thank all who have contributed. Incidentally, Dave ZL1AFQ says that John Clarricoats book should be required reading for VHF enthusiasts.

Reports from Europe

Ted Collins G4UPS, says the K1NFE beacon on 50.061 is off the air, as also is 9L1SL on 50.091. The Slovenia beacon 4N3SIX on 50.015 has changed its callsign to S55ZRS.

From 24/10 the Republic of Slovenia changed its callsign prefix from YU3/YT3 to S5 plus a figure from 1 to 9 plus the individual suffix.

Lebanon

OD5SK has a 160 watt linear courtesy of JA1VOK, plus a five element yagi. There is still no sign of the OD5SIX beacon.

Jan Mayen Island

This remote island in the Arctic Ocean is now operational on six metres. The first contact with JX3EX was made by SM3JGG at 2035 on 13/10. The JX7DFA beacon runs 10 watts on 50.079.

The October report tends to indicate a lack of F2 propagation from Europe, with contacts via TEP or Es. Those heard/worked included 3X0HNU, 4N3SIX/b, 7Q7CM, 7Q7JL, 7Q7LA, 7Q7RM, 7Q7XX, 9H1PA, 9H5AB, 9H5EE, 9H5ET, CN8ST, CT0WW/b, CT1BGE, DJ1OJ, DJ3TF, EH2AGZ, EH6ET, EH7AJ, EH7ERS, EH9IB, FC1JG, IK3GHZ, IK5NTE, IK8DYD, IT9IPQ, IV3GBO, OE6LOG, OE9FK1, OK1MAC, OK2PZW, OK3LQ, PY5CC, S51CN, SM3EQY, SM7BAE, V51VHF/b, YT3EY, YU2IQ, YU3OV, YU3ZW, ZB0T, ZP5JCY, ZS6AXT, ZS6WB, ZS6XJ, ZS9A.

Geoff Brown GJ4ICD said that from Jersey Island on 4/10 there was a TEP opening to South America with ZP5, PY5 and LU being worked and CE heard. There were a few openings to Africa and at the end of the month VK TV was heard on 46.249.5 MHz.

Other TEP openings were on 9/10 when ZS6WB reported the 5B4CY beacon at 1630, on 11/10 with ZS6, A22 and 7Q7 all strong. 12/10 started off well with Es to Spain, then linked up with TEP to provide a strong path to PY5, LU, CX and CE.

From 13/10 onwards Es openings predominated and provided contacts to 17, 18, YU3, SP, EH9 and CN8.

Tha World Above 50 MHz

After nearly 18 years, Bill Tynan W3XO/5 has finally relinquished his position as conductor of the QST "The World Above 50 MHz" columns. For many years Bill and I have exchanged VHF/UHF notes and this has given us an opportunity of getting to know one another. A highlight had to be on 8 May 1991 when I managed to work Bill on six metres during a five minute opening, giving him his first VK5 contact. The most disappointing aspect of our association was later that year when Bill, during a visit to Australia, called at my house to see me and I was in Adelaide for a medical appointment — the only day I had been absent during the previous two months! I wish Bill every success in his future usage of the VHF bands, and look forward to continuing the exchange of information with the new "baton holder," Emil Pocock W3EP, who is a well known QST author and VHF/UHF experimenter.

Bill's final notes in November QST largely concern the Perseids Meteor Shower from 11/7 to 11/8. On the latter date KJ7F said that two metres sounded like 20 metres during a contest! Large tropo openings also occurred 7 to 9/8, but the best was 21 to 23/8 and involved considerably enhanced operation on all bands to 3456 MHz. On 21/8 a 10 GHz all home station contact took place between Chuck WA6EXV in DM15dp and Phil W6HCC DM13my. The path from Chuck's 2500 foot (762 m) location to Phil's 2000 foot (610 m) location had to cross the 5000 foot (1524 m) El Paso Mountain range, scatter for about 75 miles (121 km) before knife edging over the 6000 foot (1829 m) San Bernardino Mountains. Bill comments — "who said there had to be line of sight!". The equipment was SSB/CW.

The first notes from Emil Pocock W3EP are for December 1992 and he gives considerable space to the propagation results which came from a large high pressure system, commencing 11 September, which resulted in two metres and above contacts over a vast area of central to eastern USA, encompassing portions of grid squares EL, EM, EN, FM and FN, with a central high pressure reading of 1028 millibars. (This is nearly as great a high as that which encompassed Australia on 16 March 1988 with a reading of 1032 MB) W2SZ/1 had contacts on 144, 222, 432 and 1296 MHz at distances of over 1850 km (the same from Adelaide to Albany.)

Many other stations had contacts in the 1000 km plus range. The enhanced conditions lasted for six days, so anyone who missed out must have been watching too much television!

If you are into contacts via meteor showers, keep in mind that the Quadrantids meteors peak at 1234 on 3 January 1993.

Vale VK6FM

The November issue of the West Australian VHF Group Newsletter gives prominence to the recent passing of Ron (Flash) Mould VK6FM, who was a foundation member of the Group.

Ron was an enthusiastic home-brew constructor and looking to build something bigger and better. One project was to construct a five over five over five antenna system for six metres! It was not certain whether the antenna was completed, but Ron certainly tried.

In latter years Ron was constructing a ten metre parabolic antenna for EME work on 1296 MHz, but failing health was to overtake him before it could be completed. He died on 14 October 1992 after a long illness.

Countries worked from Australia on six metres

The following are amendments to the December 1992 list.

Delete: HC5K Galapagos; HK0/W6KV Malpelo; VK2BZ Australia. Change: 4X1IF to 25/10/91 and shared by VK8AH and VK8RH; 6Y5RC to 6Y5FS on 24/03/90, VK2BA; AH8A to 19/04/81, VK2VC; C21AA to 20/12/70, VK4ZRW (VK4IT); CT1LN to 03/03/90, VK4RO; DL0SI to DL8HCZ on 12/10/89, VK8ZLX; HC2BI to HC5K on 26/03/89, VK2MQ; HL9WI to 15/04/70, VK4ZRW (VK4IT); T30DJ to T3AZ on 17/03/80, VK4RO; VS6AB to VS6HK on 05/05/78, VK4RO; YB9X to YB0X on 01/05/79, VK4RO; YV5/DL3ZM to 18/03/81, VK4RO; ZD8TC to 20/03/82, VK4RO; ZL2DS to ZL2MF on 21/12/47, VK5GF (SK); ZL9TPY to 21/01/90, VK2VC.

Following the vast number of changes to the original November list, the above represents only a small change to the December listing. There are likely to be others as times are sorted. The complete list now contains 164 countries strictly in accordance with the May 1992 ARRL DXCC Countries List.

The bands above 50 MHs

Scott VK2JSR/VK4JSR reports that activity from VK4 and northern VK2 is alive and well. The regular skeds at 0730 (NSW local time) on Saturdays and Sundays, and 2030 (NSW local time) on Mondays, Wednesdays and Fridays, continue between Gordon VK2ZAB and Ross VK2DVZ to those on the northern end of the path, namely VK2EA Lismore (144), VK2JSR/VK4JSR Alstonville (144-432), VK4ARN, VK4KZR, VK4DH, all in Brisbane north and on 144-432. VK4YZ Caboolture (144). Reports being passed on the two metre repeater indicate there are a number of listeners.

The majority of these paths are covered by aircraft enhancement modes with contact peaks lasting for up to 5 minutes with a second peak/plane around 20 minutes later. In addition, regular morning tropo also occurs. Thanks Scott, I'm glad I asked about activity. It would now be worth hearing from the Perth region!

Closure

Hopefully, next month there will be more VK activity to report but so far Es has been very slow to provide any sustained contacts. Closing with two thoughts for the month:

1. If at first you don't succeed, try, try again. Then give up, there's no use in being a damn fool about it, and,
2. We are not primarily put on this earth to see through one another, but to see one another through.

All the best for 1993, and 73 from The Voice by the Lake.

ar

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm OLD 4005. Ph (07) 358 2785.

FOR SALE NSW

● YAESU FL2100B Linear, S/N5H310330 plus four slightly used 572B finals, $1,400 ONO; KENWOOD TS520S xcvr, exc cond, desk mic, manual, two spare finals (unused), $600 ONO, VK2GZ QTHR (069) 62 3576.

FOR SALE VIC

● SHACK CLEARANCE, no reasonable offer refused, DRAKE TX4C/R4C, FTDX400, FTDX401, ICOM IC22A, VINTEN MR6 2m (240v), VINTEN 6m test equipment, new Rx/Tx valves, Books, Co-ax, Collectors! Army 19 set, MN26 R/Compass, EDDYSTONE 640 Rx, lots more, Len VK3LP QTHR (054) 72 3797.

● QRM FREE LOCATION, 3Bedr house located in Mt Beauty NE Vic, Skiing, Bushwalking, Trout Fishing Mecca, Tower with rotator fitted, shack adjoins house, $49,000 VK3DUG (057) 57 2814.

● DECEASED ESTATE of the late John Pollard VK3QZ; ICOM IC751 (S/N 01309) HF Txcvr with PS35 inbuilt PSU, AT500 ATU (S/N 05255), & SM8 desk mic, $2450 ONO; ICOM IC25A 2m FM mobile (S/N 21628) $350 ONO; KENWOOD TS120S (S/N 0010067), AT120 ATU (S/N 960862) & DFC230 Freq Cont (S/N 1041385), $750 ONO; ATN 13-30-8 Log Periodic Ant, $550 ONO; DS1136 Multi Meter $30; UNIDEN Mobile Mic $10; SWR Meters model 176 with matcher $10, MICRONTA HF $10, OSCARBLOC SWR200 (S/N 55236) $80; GDO Lafayette (S/N 992503) $30; enquiries to Tom VK3XBG QTHR or tel (051) 94 2240.

FOR SALE OLD

● HEWLETT PACKARD sig gen 608-D, covers 10 to 420 MHz, good order, $150; 7 disks communication progs suit AMIGA, $20; Herb VK4KM (071) 64 2202.

● VALVES, PWR TFRMRS, old radio parts, send your wanted list incl Tx valves. Can anyone use B&W pic tubes, LOPF yokes, etc (new) for B&W TV (valve types), give away price, subject to offer & collection, Fred Chappel VK4DY PO Box 17 Woodford Old 4514.

● KENWOOD TS820S (Digital) with ext VFO820, DRAKE low pass filter, QUEMENT PWR/SWR meter, Mic, Manuals, and homebuilt Antenna Tuner 10,15,20. New finals recently fitted. Licenced amateurs only please $525 the lot. Bob (07) 207 6715.

FOR SALE SA

● TENTEC OMNI-D546 HF xcvr and matching PSU, $900; KENWOOD TS120S HF xcvr, $550; YAESU FT290R 2m xcvr with Nicads, $380; YAESU FT221R 2m base stn with inbuilt PSU, $400; YAESU FT680R 6m mobile xcvr, $450; YAESU FT2700RH dual xcvr 2m & 70cm mobile, $800; TRANSWORLD SS Linear amp with PSU (100A) $950; KENWOOD ATU AT230, $280; KENWOOD monitor with BS8 pan display SM220, $490; John Gill VK5AJG, QTHR, (08) 296 8705.

FOR SALE WA

● ICOM IC551 6m 10W base, 12V, S/N 02702, $350; ICOM AT100 Auto tuner S/N 02159, $250; DAIWA rotator 7600A, 200kg vert load, $190; Graham VK6RO QTHR (094) 51 3561.

WANTED NSW

● FV101B ext VFO in wkg order, TELONIC RHO detector or straight detectors in any cond; WAGNER C1-25 service manual, circ diag etc, all costs paid; Ray VK2FW, QTHR, (063) 65 3410.

● YAESU FT690R 6m txcvr or similar unit; Rick VK2XRB (047) 51 2847 after 6 pm.

WANTED VIC

● DONATION OF WORD PROCESSING SOFTWARE for AMSTRAD CPC6128 CP/M computer. The recipient is an Anglican Minister of Religion who is involved with the on-going welfare of frail and aged citizens in a large hostel, but has little funding or resources. All freight costs will be re-imbursed. Please contact Bruce VK3UV QTHR (03) 580 6424, mobile 018 386 030.

● YAESU FT7 Txcvr or similar in VGC, VK3DSS (03) 870 8335.

● 3/8 inch to 1/4 inch shaft reducers, Tony VK3CTM QTHR (03) 878 4460.

WANTED OLD

● SONY ICF2020 or ICF 2001 comm rx or similar, Doug Macleod, 23 Barellan Ave, Buddina Old 4575, VK4DNM (074) 44 2170.

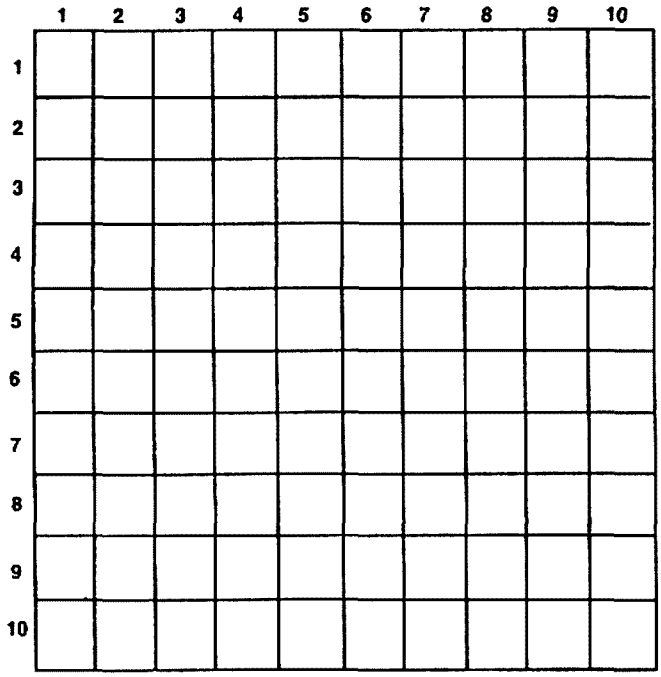
MISCELLANEOUS

● TOWN HOUSE FOR RENT, two story two bedr house in Lakemba (Sydney suburb), complete with 45ft mast, rotator and Yagis, 4el 10m, 4el 15m & 12m, 12 el 2m. Good sigs all directions. $160 PW (02) 750 8851 A hrs or (02) 692 2133 Bus, ask for Murray, VK2KGM, QTHR.

● HAVING A SHACK CLEAROUT ? Please dont throw out those QSL cards. Old and new QSLs are very welcome by the WIA QSL collection. Contact Hon Curator, Ken Matchett, VK3TL, 4 Sunrise Hill Road, Montrose Vic 3165. Tel (03) 728 5350.

ar

Morseword 70



© Audrey Ryan 1992

Across:
1. Public Transport
2 Stun
3 Wander
4 Errors
5 Unopened flower
6 Sense
7 Seeded
8 Ache
9 Magistrate
10 Church Service

Down:
1 Tremendous
2 Unfit
3 Took to court
4 Bunch of fives
5 Legumes
6 Winter month
7 Leafy
8 On behalf of
9 Flame
10 Employer

Solution Page 56

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

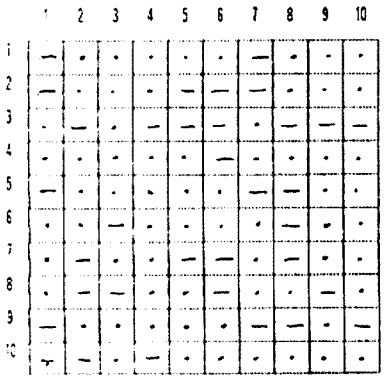
State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

Solution to Morseword No 70

Page 55



Solution to Morseword 70
Across: 1 bus; 2 daze; 3 roam; 4 sins; 5 bud; 6 feel; 7 rated; 8 pain; 9 beak; 10 Mass.
Down: 1 great; 2 inept; 3 sued; 4 fist; 5 peas; 6 June; 7 green; 8 for; 9 fire; 10 user.

TYPESETTING AND PRINTING: Industrial Printing, 122 Dover Street, Richmond, 3121, Telephone: 428 2958

MAIL DISTRIBUTION: R L Polk & Co Pty Ltd, 98 Herbert St, Northcote, Vic. 3070, Tel: (03) 482 2255

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	Price to Members
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$18.00
Antenna Collection — RSGB	BX391	$39.60
Antenna Compendium Vol 1 — ARRL	BX163	$19.60
Antenna Compendium Vol 2 — ARRL	BX292	$21.60
Antenna Impedance Matching — ARRL	BX257	$27.00
Antenna Note Book W1FB — ARRL	BX179	$18.00
Antenna Pattern Worksheets Pkt of 10	BX902	$2.70
Antennas 2nd ed John Kraus — 1988	BX259	$93.60
Easy Up Antennas	MFJ38	$35.30
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX162	$14.40
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$18.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$18.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$18.00
Physical Design of Yagi Antennas — The Book	BX388	$36.00
Practical Antenna Handbook — Tab	BX026	$44.10
Practical Wire Antennas — RSGB	BX296	$25.20
Reflections — Software 5 inch disk	BX358	$18.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$18.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$36.00
Simple Low Cost Wire Antennas	BX218	$23.00
Smith Chart Expanded Scale PK of 10	BX903	$5.90
Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$5.90
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$5.90
The Antenna Handbook — ARRL 1991 edition	BX370	$36.00
Transmission Line Transformers — ARRL	BX329	$36.00
Vertical Antenna Handbook — Lee — 1990	BX284	$20.30
Yagi Antenna Design — ARRL	BX164	$27.00
ATV		
The ATV Compendium — BATC	BX270	$15.80
CALL BOOKS		
Radio Call Book International 1993	BX339	$62.90
Radio Call Book North America 1993	BX338	$66.50
FICTION		
CQ Ghost Ship — ARRL	BX204	$9.50
Death Valley QTH — ARRL	BX205	$9.50
DX Brings Danger — ARRL	BX206	$9.50
Grand Canyon QSO — ARRL	BX207	$9.50
Murder By QRM — ARRL	BX206	$9.50
SOS At Midnight — ARRL	BX209	$9.50
HANDBOOKS		
ARRL Handbook — 1992	BX369	$47.60
Electronics Data Book — ARRL	BX201	$21.60
Mobile Radio Handbook	MFJ33	$22.50
Motorola RF Device Data — 2 Volumes	BX047	$31.50
Radio Communication Handbook — RSGB	BX266	$50.40
Radio Theory For Amateur Operators — Swainston — 1991	BX265	$38.70
Space Radio Handbook — GM4IHJ — RSGB	BX439	$49.50
World Radio TV Handbook	BX450	$36.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$7.20
50 Years of the ARRL — 1981	BX196	$7.20
Big Ear — Autobiography Of John Kraus W8JK — 1976	BX263	$11.70
Bright Sparks of Wireless — RSGB	BX394	$39.60
Dawn of Amateur Radio	BX395	$52.20
Golden Classics of Yesterday — Ingram	MFJ30	$19.40
Spark to Space — ARRL 75th Anniversary	BX310	$22.50
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$23.00
Radio Frequency Interference — ARRL — 1992 Edition	BX186	$27.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$9.50
Design Note Book W1FB — ARRL	BX357	$18.00
Ferrells Confidential Frequency Listing	BX387	$37.80
First Steps in Radio — Doug DeMaw W1FB	BX385	$9.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$27.90
Ham Radio Communications Circuit Files	MFJ37	$22.50
Help For New Hams DeMaw — ARRL	BX308	$18.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$14.40
National Educational Workshop 1991 — ARRL	BX384	$21.60
Novice Notes, The Book — OST — ARRL	BX298	$10.80
QRP Classics — ARRL — OST	BX323	$21.60
QRP Note Book — DeMaw — ARRL	BX170	$18.00
Radio Astronomy 2nd edition — John D Kraus — 1986	BX282	$71.90
Radio Auroras — RSGB	BX381	$27.00
Radio Buyers Source Book — ARRL	BX377	$27.00
Shortwave Receivers Past and Present	BX253	$19.80
Solid State Design — DeMaw — ARRL	BX171	$21.60
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$38.00
Advanced Morse Tutor — 5.25" Disk	BX328	$38.00
Morse Code — The Essential Language	BX223	$9.00
Morse Code — The Essential Language	BX223	$10.80
Morse Code for Radio Amateurs — RSGB	BX451	$14.40
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$16.70
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$16.70
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$16.70
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$16.70
Morse Tutor 3.5" IBM Disk	BX187A	$18.00
Morse Tutor 5.25" IBM Disk	BX187	$18.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$27.00
Amateur Techniques — G3VA — RSGB	BX393	$32.40
DXCC Companion — How to Work Your First 100	BX345	$10.80
DXCC Country Listing — ARRL	BX386	$3.60
FCC Rule Book — A Guide to the FCC Regulations	BX379	$16.20
Locator Map of Europe — RSGB	BX396	$5.40
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$6.30
Low Band DXing — John Devoldere	BX195	$18.00
Operating Manual — ARRL — 4th Edition	BX192	$32.40
Operating Manual — RSGB	BX359	$25.20
Passport to World Band Radio	BX346	$30.60
Prefix Map of North America	BX235	$7.20
Prefix Map of the World — RSGB (laminated)	BX397	$18.00
Short Wave Propagation Handbook	BX288	$16.20
The Complete DXer — W9KNI	BX194	$18.00
Transmitter Hunting	BX222	$32.30
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$9.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$14.40
Gateway to Packet Radio 2nd edition — ARRL	BX169	$21.60
Packet Computer Networking Conference 1-4 1982/5	BX166	$32.40
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$22.50
Packet Computer Networking Conference No 5 1986 — ARRL	BX167	$18.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX168	$18.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$22.50
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$18.00
Packet Radio Made Easy — Rogers	MFJ32	$18.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$28.80
Packet Users Notebook — Rogers	BX285	$18.70
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$15.30
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$15.80
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$15.80
Satellite AMSAT 9th Space Symposium — ARRL	BX449	$21.60
Satellite Anthology — 1992 Edition — ARRL	BX180	$18.00
Satellite Experimenters Handbook	BX177	$36.00
Space Almanac — ARRL	BX299	$45.00
Weather Satellite Handbook — ARRL	BX324	$36.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$18.00
VHF/UHF/MICROWAVE		
International VHF FM Guide — G3UHK — RSG	BX399	$12.60
Microwave Handbook Vol 1 — RSGB	BX318	$34.20
Microwave Handbook Vol 2 — RSGB	BX437	$51.30
Microwave Handbook Vol 3 — RSGB	BX447	$51.30
Microwave Update Conference 1987 — ARRL	BX174	$15.80
Microwave Update Conference 1988 — ARRL	BX183	$15.80
Microwave Update Conference 1989 — ARRL	BX321	$21.60
Microwave Update Conference 1991 — ARRL	BX446	$21.60
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$15.80
Spread Spectrum Source Book — ARRL	BX365	$36.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$67.50
UHF Compendium Part 3 & 4 Vol 2	BX251	$67.50
UHF Compendium Part 5 German Only	BX354	$50.20
UHF/Microwave Experimenters Manual — ARRL	BX325	$36.00
UHF/Microwave Experimenters Software — ARRL	BX327	$18.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$15.80
VHF 23rd Central States Con. 1989 — ARRL	BX286	$15.80
VHF 24th Central States Con. 1990 — ARRL	BX322	$21.60
VHF 25th Central States Conference 1991 — ARRL	BX438	$21.60
VHF 26th Central States Conference 1992 — ARRL	BX448	$21.60
VHF West Coast Conference 1992	BX444	$21.60
VHF/UHF 18th Eastern Conference — ARRL	BX445	$21.60
VHF/UHF Manual — RSG	BX267	$43.20
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all above are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only — postage and packing, if applicable, is extra. (Phone for postal rates.)
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

ICOM

Count on us!

IC-765

Our Base Units Have So Many Features, These Pictures Speak Louder Than Words.

IC-781

Our features speak volumes.

Rather than write hundreds of words to introduce our range of base units, we'd like you to phone us free on (008) 338 915.

We'll provide you with detailed brochures and the name of your nearest authorised Icom dealer.

Alternatively, you can write to Reply Paid 1009 Icom Australia Pty Ltd P.O. Box 1162 Windsor Victoria 3181.

Telephone (03) 529 7582 A.C.N. 006 092 575

L.L. Brown Advertising 3909

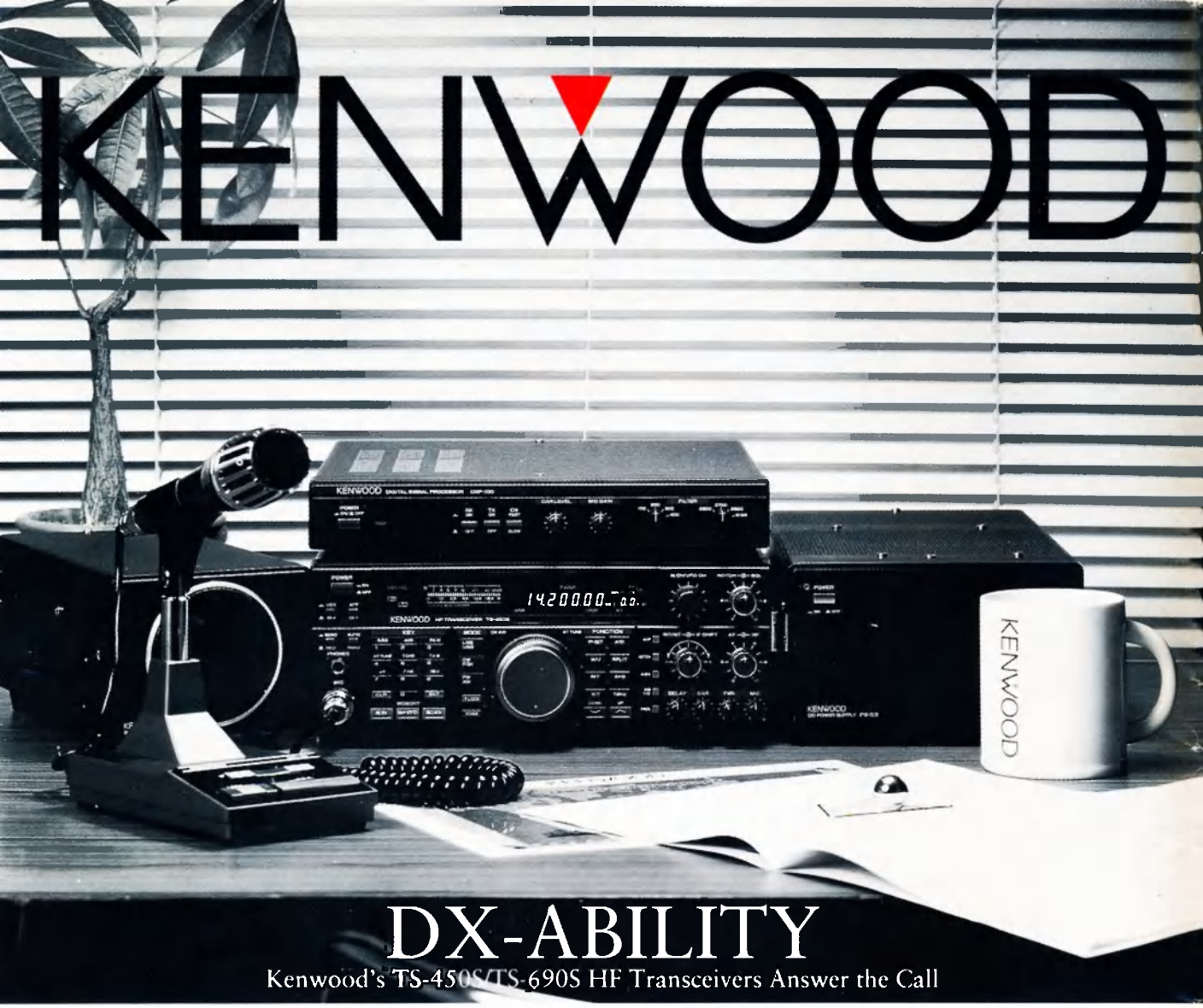
AMATEUR RADIO

- Cosmonaut U2MIR visits Melbourne
- Review — ICOM IC-R7100 Receiver
- 1992 Annual Index
- Accredited Examiners List

FEBRUARY 1993 RRP $3.25

THE WIA RADIO AMATEUR'S JOURNAL

KENWOOD



DX-ABILITY

Kenwood's TS-450S/TS-690S HF Transceivers Answer the Call

Wherever you are, whatever the situation, you can always count on Kenwood's TS-450S and TS-690S for tough, dependable performance. Products of world-famous Kenwood engineering, these versatile HF transceivers are designed for SSB, CW, AM, FM and FSK modes of operation on all Amateur bands, including the WARC bands. To further enhance capabilities, choose the optional DSP-100 Digital Signal Processor. The AT-450 Automatic Antenna Tuner is built into the TS-450S, and is available as an internal option for the TS-690S. Along with multi-function operation and the highest levels of quality and performance, both models offer yet another advantage: ultra-compact dimensions ideal for DXpeditions and mobile use.

Enjoy all the advantages of these superior features:

■ Superior receiver dynamic range of 108dB ■ Kenwood's exclusive AIP (Advanced Intercept Point) system ■ General coverage receiver ■ Automatic antenna tuner (TS-450S only) ■ Inbuilt automatic ATU option (TS-690S only) ■ Ultra-compact design ■ Excellent split frequency operation ■ CW pitch and CW reverse mode selection ■ Digital bar meter and multi-function LCD display ■ IF shift circuit ■ Dual-mode noise blanker (pulse or 'woodpecker') ■ 1Hz fine tuning ■ 100 memory channels ■ 100 watts output on all HF bands ■ 50 watts output on 50 to 54 MHz six metre band (TS-690S only)

HF TRANSCEIVER **TS-450S/TS-690S** HF TRANSCEIVER

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(INCORPORATED IN N.S.W.)

8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140
Phone (02) 746 1519, (02) 746 1888, Fax (02) 746 1509
Call now for further information and the name of your nearest authorised Kenwood dealer.

Kenwood Electronics Australia Pty Ltd only warrants products purchased from their authorised Australian dealers.

Please phone, mail or fax for information
Name.....
Address.....
..... Postcode.....
Publication..... Issue .....
Model.....

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 2 ISSN 0002-6859 February 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Margaret Allen
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
March	8/2/93	10/2/93
April	8/3/93	10/3/93
May	12/4/93	14/4/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

Maggie Iaquinto VK3CFI and Cosmonaut Musa Manarov U2MIR in the foyer of the Sheraton Towers Southgate Hotel, Melbourne, Wed 2nd December 1992. They are holding Musa's certificate of Honorary Life Membership of the WIA, (Vic Div), presented to him that evening by Divisional President Jim Linton VK3PC. Photo by Peter Ormerod VK3CPO. See story on page 7.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service — Member of the International Amateur Radio Union
Registered Federal office of the WIA: 3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Ron Henderson	VK1RH
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3ZJC
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
WARC & CCIR	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Editor's Comment

Bill Rice VK3ABP

Editor

A Mixed Bag

From time to time this magazine has carried editorials with titles like "Loose Ends, "Bits and Pieces", "Sundry Topics", "Disconnected Jottings" and "Miscellaneous Observations". Here is another collection of comments on unrelated items.

First, this issue has for some years been the annual collection of information on all sorts of things; The February "Data Issue". This year we have pruned off much of the data for two reasons. Such things as repeater listings have changed very little since they were published in the Call Book only a few months ago. The DXCC list of Countries, on the other hand is changing so fast, at least in Europe at present, that it seems better to wait until some of the dust settles! There have been no significant changes in bandplans since the Call Book. We are including the list of videotapes and the stolen equipment list, because they were not included in the current Call Book.

There is another reason for cutting back the data issue. We have a substantial backlog of general interest articles, and some of the authors are beginning to wonder if they will ever be published. We really need the space so that we can catch up a bit on the backlog. But please note that this is only a general interest backlog. **WE ALWAYS WANT TECHNICAL ARTICLES!**

One of the technical areas in which much interest has been shown recently is that of Interference Cancellation. We have had two articles by Lloyd Butler VK5BR, and in this month's Technical Abstracts, Gil Sones refers to a RadCom article on the same theme. Unfortunately there was an error in last month's article by VK5BR. So if you tried it and couldn't get it to work, check the value of R4. It should be 1000 ohms, NOT 100K! The mistake was entirely ours; Lloyd's material was correct.

Back to the Call Book for a moment. Have a look at the repeater listings; particularly note the group or organisation shown as the sponsor for each repeater. In VK3 and VK5, almost all are financed and maintained by the WIA. In other States, many of the responsible clubs or groups have WIA affiliation. But it is traditional that repeaters are open to all.

Free-loaders

Nevertheless, a very regular user of one of the WIA supplied, installed, and maintained repeaters in Melbourne, was recently heard asking for a particular issue of AR magazine. When asked why he did not have his own copy, he explained "I'm not a member"!

The nicest thing one can say about such people is to call them "free loaders". The Australian vernacular has numerous picturesque phrases for people who "sponge off their mates". Perhaps a few such words need to be murmured into a few more ears? **ar**

WIA News

From the WIA Federal Office

Delivery of Amateur Radio Magazine

As advised in WIA-NEWS in the December 1992 issue the WIA changed over to an alternative delivery service for delivery of the magazine to 64% of members. Worthwhile savings were expected, and delivery was guaranteed to be comparable to the Australian Post Office.

It was a great idea at a time when the WIA is holding membership fees down, and continually looking for cost savings. However, as too many members found out, it turned into a fiasco. A considerable number of members did not receive their December magazines until late in the month. Many members still have not received their December magazine.

The Federal Office mailed out all the reserve stocks of the December issue (well over 150) as replacement magazines, but still reports are being received of members not having received this issue. Now we do not have any December ARs left to send to them.

I know that many of those to whom we mailed replacement magazines subsequently received the original copy from the delivery service.

It would be appreciated if these members could send the duplicate copy back to this office so that we can send it to those who still have not received the December issue.

A much greater percentage of the January 1993 issue was delivered satisfactorily, but far too many were delivered late, and some members have still not received their copy.

If you still have not received the January issue by the time this issue arrives, please let the Federal Office know and we will forward you a replacement copy.

Needless to say, the alternative delivery organisation has been sacked for lack of performance. We can all breath a sigh of relief that this, and future issues of our magazine, will again be delivered by APO, even though they are expensive, and erratic at times.

AR Magazine 20 Year Index

Reaching back to 1968, this index of articles published in *Amateur Radio* magazine is available on disk and in hard copy from the Federal Office.

Disks can be obtained in ASCII format for $10.00 each (inc. postage), on both 3.5" and 5.25" floppies.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Divsion, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Terry Ryeland Bob Lloyd Jones Bob Taylor Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Ken Ayers David Travis	VK4QA VK4KD VK4ATR
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allen Roland Bruce Bill Wardrop	VK5BJA VK5OU VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland-Thomas	VK6LZ VK6AFA VK6OO
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			

Note: All times are local. All frequencies MHz.

Weekly News Broadcasts		1993 Fees
3.570 MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70 cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.120, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S). (X)	$72.00 $58.00 $44.00
1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00

Membership Grades

Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times.

Hard copy costs $10.00, including postage.

However, the database file format (.DBF) is more useful if you have suitable software, as it makes searching and viewing easier.

For those with a computer who do not have software facilities to read and search .DBF files, the index can now be obtained with software that allows viewing, searching and updating. All you have to do is request it.

In .DBF format, the index can be obtained on 3.5" disks for $10.00 each (inc postage), or on 5.25" disks for $12.00 each (inc postage).

The software for viewing and searching the .DBF format index was written and has kindly been provided free of charge by Nigel Dudley VK6KHD.

Call for Papers on Education

The ARRL has called for papers for the 1993 edition of *Proceedings of the ARRL National Educational Workshop*. Topics should cover curriculum development, training techniques, acceptance of ham radio in school systems, one-on-one tutoring, and working with youths, seniors and the disabled.

The 1992 edition of the *Proceedings* was reviewed in Brenda Edmonds' "Education Notes" in the July 1992 issue of AR.

Papers are due at the ARRL by 29 June, 1993. Contact Tracy Simpson, c/o ARRL, 225 Main St., Newington CT 06111 for an author's kit.

Weather Fax From Antarctica

A new station transmitting weather charts by facsimile (fax) on HF from Antarctica has joined the well-known Bureau of Meteorology HF weather fax stations AXM (Melbourne) and AXI (Darwin).

Located at Casey Base on the Antarctic continent, the new station signs VLM and runs 1 kW FSK. It was announced by the Bureau of Meteorology, Tasmanian and Antarctic Region late in December.

Meteorological charts from the Bureau's three stations can now be received from 25° North to around 80° South on an "all-day, all year round service", the Bureau says.

A schedule booklet setting out times, frequencies, data and chart reading information for AXM, AXI and VLM is available from the Bureau's Melbourne office. Write for an application form, to:
Angus Low
Bureau of Meteorology
c/- PO Box 1289K
Melbourne Vic 3001.

Emerging Communication Technologies

The telecommunication regulator, AUSTEL, will report to the Federal Government by the middle of this year on emerging technologies in Australia aimed at providing "personal communication services" (PCS).

These new services use a broad range of "wireless-based" (ie radio) communication services together with computer networking technology to provide a sophisticated mobile-portable network.

Both voice and digital data communication technologies are involved. The WIA has an active monitoring watch on these developments to assess the possible impact on the Amateur Service.

ITU Restructuring

The International Telecommunication Union (ITU) is progressing with work on a substantial revision of its structure and operation, driven by rapid technological change and the integration of technologies into new value-added services and the globalisation of networks and services.

It is the third major restructuring undertaken by the ITU in its 127-year history.

According to an ITU press release dated 30 November 1992, the High Level Committee (HLC), established in 1989, put up 96 recommendations to be considered by a conference held in Geneva last December.

These developments will have substantial impact on radiocommunication services, including the Amateur Service, throughout the world in the coming decade.

The ITU has developed as a major standards-making body, with two technical subsidiaries — the radio consultative committee (CCIR) and the telecommunications consultative committee (CCITT).

The release said the HLC recommended that these committees" standards-setting activities be consolidated into a "Standardization Sector", while the other CCIR activities be merged with the ITU's International Frequency Registration Board to form a "Radiocommunication Sector".

The HLC's recommendation envisages the Radiocommunication Sector operating through Radiocommunication Conferences and Study Groups ('mini-WARCs', if you like), a Radio Regulation Board and a permanent Bureau headed by a Director, according to the ITU release.

Conferences would consider regulatory and technical matters and review the Radio Regulations. There would not be ad hoc conferences (as in the past), but would be held every two years in an attempt to "bridge the gap" between the Radio Regulations and the radiocommunication environment, the release said.

This "gap" develops as a result of the rapid development in technology; a WARC every decade is no longer able to cope.

In terms of the Amateur Radio Service, this means more active and continuous work for the world's radio amateur societies, including the WIA — perhaps more so in our region than other parts of the world because of the rapidly burgeoning communications environment in the Asia-Pacific region, in which Australia is a principal player.

WIA Policy Revamp

The WIA Federal Board has completed a major revamp of twelve Federal Policy items, covering topics such as Amateur Television and Packet Operation, QSL Bureaux and Novice Licensing, Education and Public Relations.

Policies are essentially dynamic documents, and must change with changing circumstances, reflecting trends in amateur activities and requirements. You may note that some originated a scant few years ago.

These policies are used to "guide" the actions and activities of the Federal WIA. They do not serve as "dogma" or "dictates" to the members, or the amateur community at large, for that matter. Guidelines serve the greater interest, not the purposes of a few.

They have been formulated through wide discussion and consultation among the Divisions and members, and the wider amateur population, and refined through debate at Divisional and Federal level.

As AR magazine serves as a "journal of record" among its other functions, we will be publishing the updated policies over the coming months. Space limitations prevents us publishing them all at once.

This issue, three have been selected for their particular importance and topical interest.

QSL Bureaux

This Board NOTING:

The report on QSL bureaux in the WIA prepared by VK2PS in response to Council resolution 89.10/2 which was distributed to all Federal Councillors and Executive members;

IARU Misc Rule 3(b) concerning member societies accepting inwards QSL cards for collection by non-members;

There are no legal constraints on the disposal of QSL cards received; and

QSL cards have PR value and are collected by the Federal QSL card curator for this purpose.

This Board AGREES:

There is no case at present for a single national QSL bureau for Australia, and AGREES the existing arrangements of Divisional bureaux with Federal Office providing the VK0 & VK9 bureau continue.

As a general principle QSL bureau services be available to all amateurs, members desirably free or for handling costs, non-members to pay at least cost recovery charges WITHOUT exception.

Outwards cards for members should be sent desirably free or for handling costs.

Outwards cards for non-members may be processed for a handling fee where cards are delivered free of charges to the bureau.

Inwards cards be made available free of charge to members at a point of distribution at least monthly and Divisions may require members to pay postal charges if onwards posting is required.

Inwards cards be made available to non-members at the bureau distribution point, however transportation and sorting costs will be imposed.

Incoming cards not collected after 6 months be disposed of by what ever means the Division decides and this policy receive wide publicity.

It is desirable to obtain written advice from operators who do not wish to receive QSL cards.

and ENCOURAGES:

Divisions to revise their QSL bureau administration systems to streamline operations and attract volunteer labour yet meet local audit requirements.

Amateurs to use the interim standard IARU QSL card size of 140 mm by 80 mm, of a minimum paper weight of 100 gsm, laid out with all QSO information contained upon one side and DIRECTS the Federal Office to give these specifications maximum publicity; and,

DIRECTS the Federal Office to prepare an Australian pamphlet (in several languages) on QSLing for local and overseas distribution. Key contents are to include correct bureau addresses however it could extend to include procedures, card sizes etc; and,

RECOMMENDS smaller Divisional QSL bureaus examine the feasibility of increasing the frequency of outwards despatches by grouping up with other bureaus to create economic mailing packages.

References: IARU Misc Rule 3(b) 82.098 90.07.01/EC
Previous version: 90.07.01/EC
Revised: Jul 92 Board meeting, VK2 input and Oct 92 Board meeting
Adopted: Oct 92 Board meeting

Novice Licensing

This Board NOTING:

The Novice licence was introduced as a means of entry introduction into amateur radio.

The original licence intent was to provide limited tenure, with low powered, crystal controlled emissions in the CW mode.

Its introduction provided access to several HF bands.

Following introduction of the licence, representations led to enhanced conditions and access to portion of the 2 metre FM band; and

These various modifications to the licence conditions narrowed the gap between NAOCP and AOCP privileges.

This Board:

AGREES there should be no licence grade lower in technical qualifications than novice.

OBSERVES that any substantial increase in novice privileges would further reduce the differential between the existing grades of licences.

SUPPORTS the recruiting and education of persons to the novice level NOTING the operating training and on-air experience it provides.

RESOLVES to seek a codeless limited novice licence with VHF/UHF operating privileges only.

RECOGNISES the ongoing benefits of education and operating to enable upgrading to the privileges of higher grades of licences.

RECOGNISES the matter of increased novice privileges has been raised on frequent occasions in the past and RESOLVES to maintain the status-quo as long as the band segments available to Australian amateurs remain unchanged. In particular this applies to the 80 metre band segment assigned to novices.

RECOGNISES the popularity of the relatively narrow and crowded 80 metre band segment and RECOMMENDS local operations, where practical, be on the 10 metre and 2 metre bands.

References: 76.20.02 86.09.01/1 89.04.22/2
Previous version: 82.092/1 Appendix C7
Revised: May 92 & Jul 92 Board meeting (no changes made)
Adopted: Oct 92 Board meeting

Packet Radio BBS Guidelines

This Board CONSIDERING:

The value in providing guidance on aspects of packet radio bulletin board operations.

This Board RESOLVES that:

Packet Bulletin Board systems operators be requested to observe the following guidelines:

Service Level

When an individual or group decides to establish a Bulletin Board, its Service Level must also be established and publicised. The Service Level is a description of what services will be provided.

As part of the service definition, the Service Area of the BBS should also be defined. This is a description of what area the BBS will service, and would normally define from where the BBS would accept users who use the BBS as its home BBS, and where the BBS would forward to PMS systems if these are supported.

Beaconing

A BBS should beacon regularly only within its service area and the period

should not be shorter than one beacon every 30 minutes.

Software

The software to be used is the choice of the BBS operator. If the BBS is to interface to the mail forwarding network, then the software should support, at a minimum, BIDS and Hierarchical forwarding.

Users

Users should be treated courteously. Likewise, Users should treat Sysops courteously. Excluding a user from a BBS should only be done on wilful and persistent breaches of these guidelines.

Mail Forwarding

Where the mail forwarding is conducted on user frequencies, it should be restricted to non-peak times or other time to minimise the intrusion on the normal operation of non BBS traffic. If forwarding takes place on dedicated frequencies, then no restrictions apply.

Message Sizes

Where a message may be routed via HF, the message should be restricted to 3 K bytes in length. For more reliable paths, longer messages may be used, but keeping messages reasonably small is a desirable aim.

Number of Bulletin Boards in an Area

As a general rule of thumb, for a general mail handling Bulletin Board, each operational port can support up to about 200 casual users, with a lesser number of regular users. If there are less than about 25 regular users, then there is probably insufficient justification for another general BBS. In areas with a high number of users, more than one BBS may be required.

Special purpose BBS should be considered separately. The Service Level of a special purpose BBS should not overlap to any significant extent with that of an existing general purpose BBS. A separate frequency for a special purpose BBS should be chosen where possible.

Reference: 87.09.08
Previous version: 91.10.04/EC
Revised: Oct 91 & Jul 92 Board meeting
Adopted: Oct 92 Board meeting

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of December 1992

L10155	MR B BAKER
L20873	MR R SPAIN
L30830	MR P RICKETTS
L30831	MR D MURRAY
L40338	MR T B BARTHELSON
L40339	MR S R HORN
VK2BRB	MR R L CLOSE
VK2CXC	MR C PRADIER
VK2GVR	MR S A KNOWLES
VK2MMF	MR J DUDLEY
VK2MML	MR J C COWELL
VK2PGA	MR G PAL
VK2TAR	MR S A WATSON
VK2TEN	MR P C BULLIMAN
VK2TLL	MR L ZILLI
VK2VX	MR A H WOOD
VK2WAD	MS W K ANDERSON
VK2WPT	MR P D THOMAS
VK3KGD	MR R S READ
VK3MCT	MR J PINCOCK
VK3MIY	MR H INHOVEN
VK3PUG	MR D WARD
VK4BF	MR R C TULLOCH
VK4JUD	MR K J DUNCANSON
VK4KEL	MR G SANDERS
VK4LMO	MR H R HART
VK4TDE	MR D E FURNESS
VK5KPK	MR J KOBES
VK5NDG	MR G M RIEDE
VK6ARQ	MR P B READ
VK6PCE	MR D N PLANE
VK6YFC	MR M P WALLACE
VK7AX	MR A I BEDELPH

ar

Cosmonaut Manarov visits Melbourne

A fitting culmination to the international year of the satellite.

Compiled by Bill Magnusson VK3JT from a detailed diary and photographs by Peter Ormerod VK3CPO.

Readers may recall that Maggie Iaquinto VK3CFI was recipient of the Ron Wilkinson Achievement Award in February 1992. This was in recognition of her work with the cosmonauts on the Russian Space Station MIR in helping them set up their packet radio station. The PMS on board MIR has gone on to become possibly the most widely known and worked packet radio system ever. In the process Maggie or Margarita (Rita) Ivanovna, as the Russians called her, became firm friends with the succession of crew members on the space station.

Musa Manarov in Melbourne

Imagine her excitement on Nov 28th when a message from Vern WA2LQQ via UoSAT-22 announced that Musa Manarov U2MIR, Maggie's original contact on MIR, the guy with whom she did all that early work, was coming to Melbourne on Nov 30th and had asked if it would be possible to meet her. Maggie went into overdrive. How could all this be organised in such a short time ?

Enter David VK3UR. David is connected with the organisation that sponsored Musa's visit to Melbourne to take part in an international conference on state of the art communications. Musa and two colleagues were to present a demonstration of data store and forward techniques using low cost ground station equipment and small, low earth orbiting satellites not unlike amateur satellites. These systems are of great interest to developing countries and international aid organisations.

Welcoming Committee

David's effort in organising the Russian group's formal professional presentation and their leisure time activities was nothing short of heroic. He probably didn't get much sleep at all during the visit.

Maggie was attending a conference in Melbourne herself that week so we organised for her to stay at my place when she wasn't involved with her meetings. Bearing in mind that Musa and company would be very tired after their long trip, a small "welcoming committee" was hastily assembled. Maggie VK3CFI, David VK3UR, Peter VK3CPO and I met Musa and party, at Tullamarine around midnight on Monday 30th. Musa's colleagues, Mikhail and Slav are communication scientists but not radio amateurs.

The first meeting between Musa and Maggie (Rita) was something to behold. A large sign "MIR/VK3CFI" being waved around wildly to attract Musa's attention. The broad grin of recognition as he came through the customs gate. It was wonderful. They had both obviously looked forward to the moment for so long. They rode to the Sheraton with David, talking excitedly in Russian/English. Musa proved to be a warm fun-loving guy with a wonderful sense of humour. (As well as still holding the world record for the most time spent in space). As expected the guys were pretty tired after their virtual non-stop flight from Moscow. They appreciated the welcome being kept low-key. We ferried them to their hotel and left them to get some rest.

The next few days were filled with furious activity. Despite suffering from jet-lag, they wanted to fit as much as possible into the short time they were to stay in Melbourne.

Tuesday evening saw us all take off for a small Turkish restaurant in Richmond. An unsuccessful attempt to contact MIR from a dingy little upstairs room left the restaurant owner quite perplexed. An early night was dictated by the all important conference presentation by Musa, Mikhail and Slav the next day.

Photographs for Australian Geographic Magazine

Australian Geographic Magazine got wind of the visit and arranged for a photographer to meet us all at the Sheraton on Wednesday evening.

A long photo session captured the occasion to form part of an up-coming article in Australian Geographic which will feature all aspects of the hobby of Amateur Radio. Jim Linton then interviewed Maggie, Musa and Bob VK3ZBB on the Yarra South Bank for the Sunday morning WIA broadcast. Bob took part in Musa's very first amateur radio QSO from the space station on 15th Nov 1988. He subsequently received a QSL card from Musa's QSL manager confirming this historic contact. Musa personally autographed the QSL card for Bob that evening.

Another fruitless attempt to contact MIR caused some anxiety. Would we ever make it ? Although Maggie made a rather noisy voice contact with MIR on her way home, it was still uncertain whether the crew knew that Musa was trying to contact them. Peter VK3CPO made packet contact with the MIR PMS on a subsequent pass late that night and left a quite un-ambiguous message to the effect that Musa was trying for a QSO whilst in Melbourne. Receiver de-sensing on MIR caused by command transmissions on 143.625 MHz and local QRM make it impossible for Musa to do this from his home in Russia.

Success!!

Contact with MIR at last. At 8pm, 3rd December 1992, prior to a most enjoyable evening meal, which Maggie's husband Lou VK3DFI and Jim Linton

VK3PC were able to attend, Musa called (and to every-one's delight), made contact with Anatolij U6MIR on board the Space Station MIR. Peter's 1 watt hand-held transceiver did the trick and Musa used his "Australian" callsign, U2MIR/portable VK3. A spirited conversation followed, appropriately translated by Mikhail for all to hear. What an exciting culmination to the visit.

Peter's photo shows the QSO in progress from near the Yarra South Bank with MIR somewhere low in Melbourne's south-western sky in the back-ground. Only a few nights before the space station had been plainly visible but there was just too much daylight to see it on this occasion. Musa was quite moved by the event and went to some pains to thank Maggie for the wonderful surprise.

Their formal presentation went off smoothly and from all accounts was warmly accepted by the international conference. The visit ended on Saturday 5th December with David once again stepping forward to organise a drive around the bay-side beaches and a visit to the Melbourne Zoo on the way to the airport. On this occasion David was ably assisted by Joe VK3BKI and Gwen VK3DYL. Maggie was unable to attend their farewell but per medium of the Geelong repeater she and Musa conducted their goodbyes when the party arrived at Melbourne Airport.

Musa's very first contact with MIR!, with Maggie Iaquinto VK3CFI.

A memorable week for all concerned. Musa's stories of life on the space station were at once astonishing, hilariously entertaining and very enlightening. My lasting impression is of one incredibly laid-back guy, completely in control and justifiably proud of his own and his country's achievements in space research.

ar

Amateur Radio and Electromagnetic Compatibility

PART 2

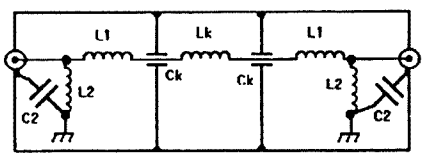
Hans Ruckert VK2AOU
EMC Reporter
25 Berrille Road
Beverley Hills NSW 2209

Low-Pass filter

Fig 8 shows the circuit of a low-pass filter which has been used for a long time by many manufacturers and amateurs. The table lists the component values for two filter versions with cut-off frequencies between 32 and 38 MHz. The formulas permit calculating this type of filter for other desired frequencies.

LOW PASS FILTER (CIRCUIT AS IN FIG 8)
SAMPLE RESULTS FILTER COMPONENTS & FREQUENCIES

	CASE 1	CASE 2	
f_c MHz	32	35	
f_∞ MHz	45	47	
M	0·7	0·667	
R Ω	52	52	
LK µH	0·517	0·473	
L1 µH	0·36	0·315	
L2 µH	0·188	0·197	
CK pF	191	175	
C2 pF	67	58·3	
f_a MHz	38·5	41	
f_b MHz	22·7	24·8	
MHz WITH L1	26·5	27·8	18 mm LONG 7 TURNS 12 mm I D
100 pF L2	37	36	16 mm LONG 7 TURNS 9 mm I D
PARALLEL LK	22	23	24 mm LONG 11 TURNS 17 mm I D
FOR COIL ADJUSTMENT WITH	0.0 0		1·8 mm Cu WIRE



(Ck are Feedthrough Capacitors)

Figure 8b — Low Pass Filter with Feedthrough Capacitors

It is absolutely necessary that the filter components are in three RF tight compartments, or stray RF will bypass the filter at higher frequencies. It is also absolutely necessary that especially the capacitors CK are of the feedthrough type, so the earthed capacitor electrode

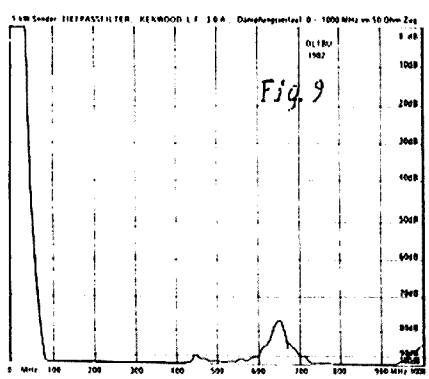


Figure 9 — Refer Text

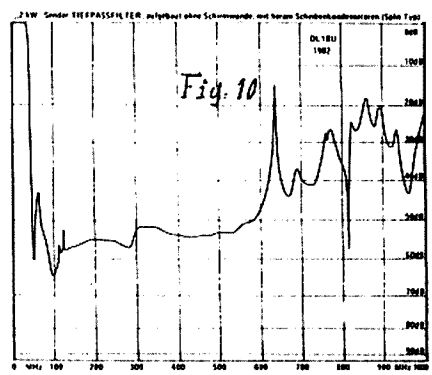


Figure 10 — Refer Text

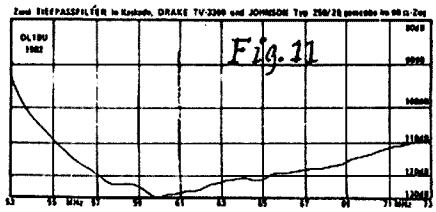


Figure 11 — Refer Text

is directly in contact with the shielding wall. Even a 1 cm = 10 mm long wire lead would have 10 cm inductance = 0.010 µH, which would give a self-resonance frequency near 100 MHz.

Fig 9 shows the response curve of the well designed low-pass filter LF-30A from Kenwood, over the frequency range up to 1000 MHz.

Fig 10 demonstrates what does happen if the separating shielding walls are omitted, and if disc capacitors with wire leads are used.

Fig 11 demonstrates the added attenuation which results if two low-pass filters are connected in cascade (in series), the Drake filter TV-3300 and the Johnson filter Type 250/20, using a 50 ohm load.

Should a particular harmonic be difficult to suppress, one can place across the transmitter output terminal either a series tuned circuit or a coaxial 1/4 wavelength stub. In the first case one can make two small coils from the disc capacitor leads for example. In the second case, one has to consider the velocity factor of the cable used (0.66 for

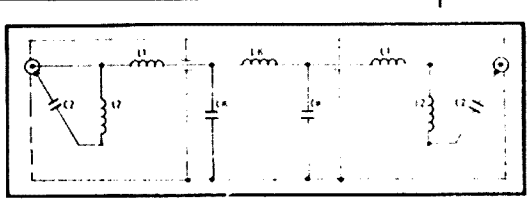
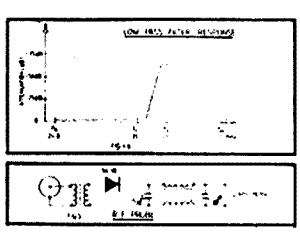
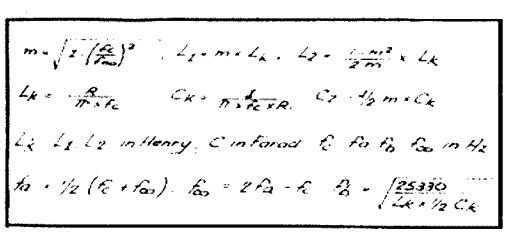


Figure 8a — Low Pass Filter





RG8AU). The open stub can be connected via a T-connector to the amplifier and antenna.

Fig 12 shows a split filter which may not reduce the harmonics at the antenna terminal, as intended and hoped for. In one commercial split filter the high-pass components were not sufficiently shielded from the desired low-frequency power so that the DC meter at the output end of the high-pass filter did not only show the filtered-out unwanted harmonics, but also a substantial amount of wanted low-frequency RF power. D is the diode to rectify the high frequency RF. R is the load resistor, which is hoped to absorb the unwanted high frequency RF harmonic power.

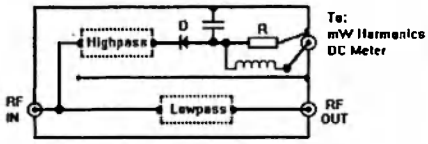


Figure 12 — Split Filter

Fig 13 shows the "Haro" low-pass split filter and the "Schertler (both German firms) high-pass filter response curves. A split-filter would give similar results if the high-pass filter is in a separate shielded compartment. The hi-pass filter must reject as much as possible all traces of the transmitter frequency power below 30 MHz. The DC output signal from the hi-pass filter can be indicated by a mA-meter, which is calibrated in milliwatts. Fig 14 filter photos. For more details see AR November 1987.

The audio frequency ferrite-ring choke with two windings using opposing windings to avoid saturation of the core, can be used to avoid RF radiation from speaker or key cables. The same method with larger low-Q and high-permeability ferrite cores, like TV-line output transformer cores, can be used to suppress leakage going along the mains power cable of transmitters.

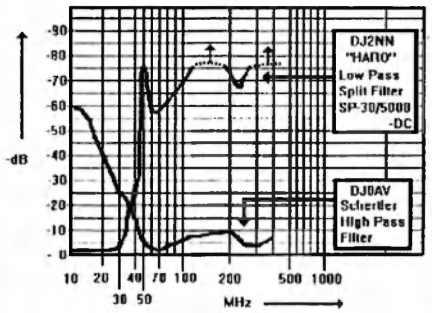


Figure 13 — "Haro" Low Pass Filter and "Schertler" High Pass Filter

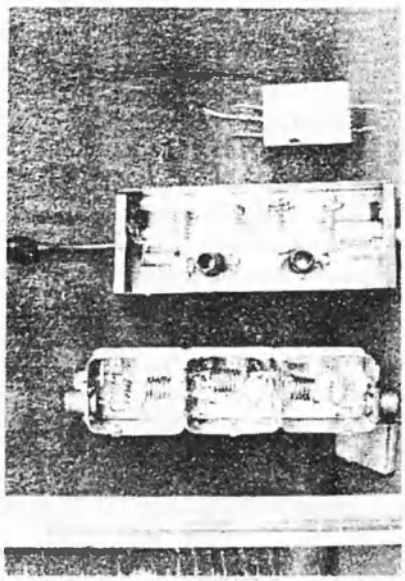


Figure 14 — Refer Text

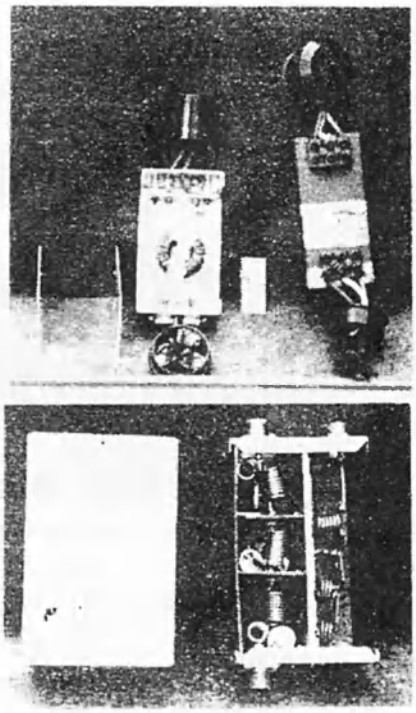


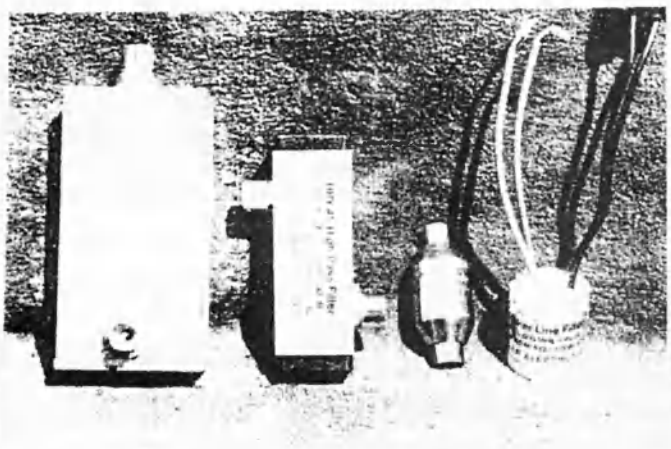
Figure 14 — Refer Text

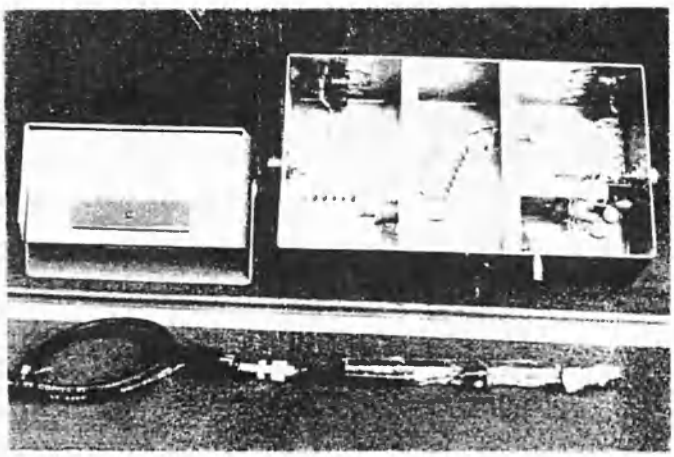
Typical data for a loudspeaker twin coil choke:

Attenuation above 500 kHz 40 dB
DC resistance 50 milliohm (2 x 25)
Max AF power load 125 watt/4 ohm
Size 25 mm diam 30 mm length

No audio distortion has been found. Other RF ferrite core chokes achieved attenuation of 20 to 40 dB over a claimed range of 3 to 500 MHz.

There is not much else we can do with our transmitter. We can try to convince the local council and neighbours the problem would be reduced if we are permitted to use the greatest antenna height we can afford. At one





wavelength height above ground, direct radiated and the ground reflected signal combines, so that the main radiation lobe has an elevation angle of 15 degrees, which is very desirable for long distance communication (21 m for 14 MHz). The unwanted signal is weaker under the transmitter antenna, as much below as possible, than in front of the beam.

What can be done to the TV receiver, hi-fi radio and VCR?

We can demonstrate to our neighbour what can or has to be done to this equipment by showing what we did to our own gear in order to overcome susceptibility problems (lack of selectivity).

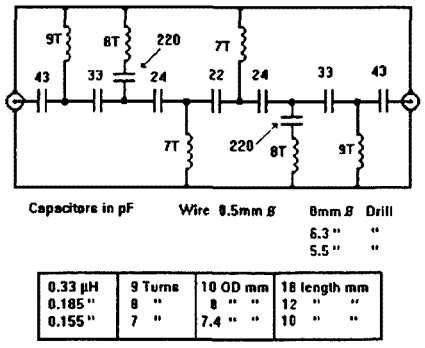
Antenna separation transformers

RF front-end overload can occur when the TV feeder picks up too much amateur transmitter energy, perhaps when the feeder is one-half wavelength long (10.6 metres for 14.2 MHz). It can help to connect the TV antenna shielding braid to a water pipe where the pipe comes to the surface. We can insert a TV separation transformer between TV set and feeder. One type consists of two 28 cm long pieces of RG59 cable, formed to make one turn each. Each turn has a plug at one end, whilst the other two ends have the inner conductor soldered to the braid of the same turn. The two cable turns are placed on top of each other and held together by insulating tape. The attenuation is about 20 dB at 10 MHz, but only 5-8 dB at TV frequencies.

The industry uses separation transformers, which use a very small ferrite ring of high Q and low μ with two windings of three turns. This transformer is bridged by a 4 pF disc capacitor to assist the passage of UHF TV signals. This transformer has very small losses of 1-9 dB over the frequency range of 20 to 400 MHz.

High-Pass Filters

The Telefunken (Germany) hi-pass filter (Fig 15) uses series connected capacitors and inductors to ground, like the ARRL hi-pass filter. Two series-tuned circuits are incorporated, which result in 52 dB attenuation at 30 MHz.



0.33 µH	9 Turns	10 OD mm	18 length mm
0.185 "	8 "	8 " "	12 " "
0.155 "	7 "	7.4 " "	10 " "

Figure 15 — Telefunken High Pass Filter, -52 dB at 35 MHz, -1dB at 50 MHz. Capacitors in pF.

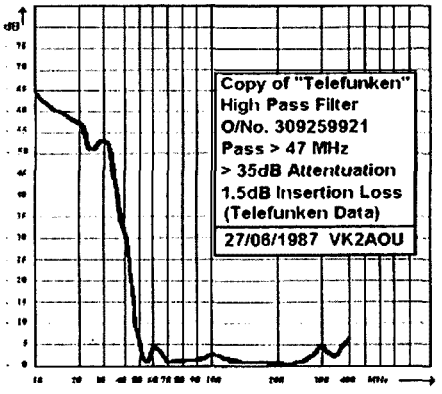


Figure 16 — Graphical performance of Telefunken High Pass Filter

Hi-pass filters seem to be most effective if they are installed (soldered) directly to the cover of the TV tuner, and inserted between the tuner input and the internal TV feeder cable. A filter component layout has to be used, which avoids coupling between the coils and the input and output filter terminal. A separating shield between the filter halves could help, too. Ferrite core chokes can also be most helpful when attached to the cables entering the TV receiver, hi-fi receiver, computer etc. A pair of "C" cores, as used in TV line-frequency transformers, are most suitable for mains line chokes, by winding 10-15 turns of the mains cable around this core. The two halves of this core are helpful when the mains plug is moulded to the cable, making it impossible to wind the cable around a ring-shaped core. A smaller ring shaped core can be used if a choke is to be made with TV feeder cable. The same goes for ferrite chokes which are to be used on hi-fi receivers, VCRs and computers etc.

If the problem occurs only at a particular frequency, one can use either a quarter wavelength coaxial open-end stub or a L-C series tuned circuit, adjusted with a trimmer capacitor, installed at the antenna terminal of the equipment involved. One can expect an attenuation of 30 or more dB. The graph (Fig 17) shows the attenuation curves of two coaxial 1/4 wavelength open stubs. The Belden 9913 low-loss cable offers a high degree of attenuation, as was to be expected, compared with RG8U cable.

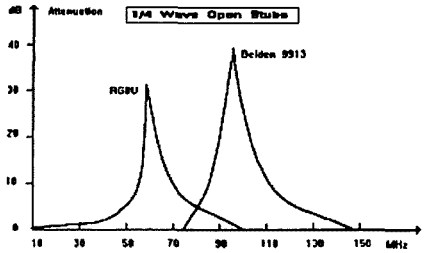


Figure 17 — Attenuation Curves of Two Coaxial 1/4 Wavelength Open Stubs

Fig 18 shows the response curve of a manufactured coax braid breaker transformer which should reject the shortwave band, but offer little attenuation for TV frequencies. This transformer does this very well.

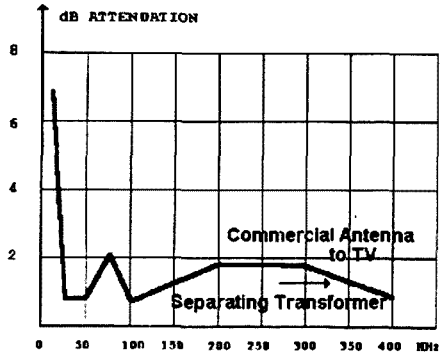


Figure 18 — Response Curve Coax Braid Breaker Transformer

Fig 19. This graph shows two response curves of ferrite core mains line chokes and two curves of ferrite core loudspeaker chokes. All chokes have a useful rejection of the 10 to 80 MHz frequency band, and again at the UHF range for the mains line chokes. The optimistic attenuation of over 40 dB at frequencies above 500 MHz for the loudspeaker choke could not be confirmed. The attenuation of 20-30 dB at short-wave frequencies is useful, but there does not seem to be much attenuation in the VHF and UHF ranges.

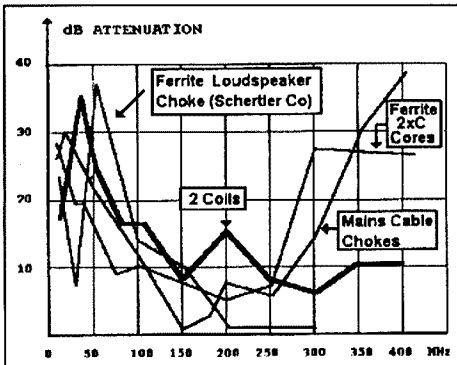


Figure 19 — Two Response Curves of Ferrite Core Main Line Chokes and Two Ferrite Loudspeaker Chokes.

Fig 20 demonstrates the effect of the braid of coaxial cable attenuating especially frequencies above 150 MHz, whilst the RF which goes along the inner conductor of the coax is unaffected. The mains cable choke, wound on a ferrite ring of 60 mm od and 30 mm id having 16 turns, has a useful attenuation from 10 MHz to over 400 MHz of 20-40 dB.

Cases have been experienced whereby moving the TV set to a different location, even in the same room, or by plugging the mains cable into a different power point, that the disturbance was reduced or even eliminated. The overhead power lines and the wiring inside a house can pick up transmitter power and re-radiate it, often producing harmonics into the TV and attached cables. These are the cases where unwanted diodes cause harmonics to appear. Even switched-off TV preamplifiers can do this too, because they contain either diodes or transistors, which act as diodes when the power is switched off. Ferrite core chokes can play a major part in overcoming EMC problems, and they can make the use of low-pass and high-pass filters more effective. Computers and VCRs may in extreme cases require to be placed in a shielding box. Ferrite chokes have to be used where cables enter the box. Especially small radios which have no metal shielding at all, are usually impossible to make less susceptible. Radio inspectors who are called to investigate EMC problems experienced by owners of these radios, tell (in Germany) the customer that nothing can be done in these cases, and that the radio amateur is not to be

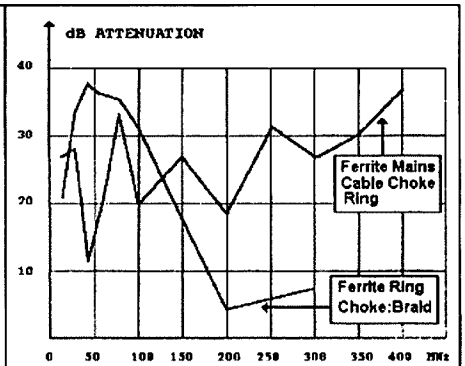


Figure 20 — The Effect of Coax Braid Attenuation

blamed. These receivers would never pass any test-cell measurement. The same goes for unshielded tape recorders.

There are many more special EMC cases which have been described in earlier WIA EMC Reports. We can expect more and new EMC problems, as more and new electronic devices are being introduced. Radio amateurs are not the only electronic communicators who face these problems.

ar

Pager Interference: Problems and Approaches

Interference to 2m operation originating from pager transmissions immediately above 148 MHz is a rapidly proliferating problem. The WIA has tackled the issue in recent discussions with DOTC. This article outlines the problems raised with DOTC and approaches to how they may be resolved.

Ron Henderson VK1RH
Federal President WIA

THE WIA FIRST had an opportunity to comment upon DOTC Guidelines for the Pager Services back in mid 1991. This was reported in WIANEWS in the November 1991 issue of *Amateur Radio,* and again in WIANEWS in the July 92 issue, where it was advised the WIA was not happy with the apparent lack of attention accorded our first comments.

Two articles on pager interference were also published in the July 1992 and August 1992 issues of *Amateur Radio.* Those articles clearly identified the three differing types of pager interference to the amateur service, namely:

(a) an inopportune combination of site frequencies giving rise to intermodulation product interference;

(b) crossmodulation arising from a strong unwanted signal imposing itself upon a weaker wanted signal; and,

(c) adjacent channel interference arising from excessive transmitter sideband noise or reduced receiver selectivity.

Arising from the WIA's concerns, four key issues regarding pagers were raised with DOTC for resolution. At a September 1992 meeting in Canberra with Spectrum Planning and Policy staff, the first two were clarified and the remainder carried over to a second meeting with Licensing Policy staff in November last year. A recent letter from the Licensing Policy area has now completed outstanding actions on those remaining issues.

Issues

The four issues and the considerations involved are:

(i) Application of the "new standards".

DOTC assured the WIA the *Radiocommunications Assignment and Licensing Instruction (RALI) LM2 — Pager Services,* was the standard for all pagers and where EMC/RFI problems occurred, would be used in resolution of those problems.

(ii) Correction of erroneous filter statements in the guidelines.

DOTC advised the statement in dispute applied to receiver intermodulation problems and not to transmitter

sideband noise. DOTC agreed a notch filter in the pager transmission path tuned to an amateur frequency, would reduce pager sideband emissions on that adjacent amateur service.

(iii) On-site support by DRIs.

On this matter, DOTC took note of the WIA's points, which were principally concerned with pager transmitter sideband noise interference to amateurs, and said they would need to consult with Regulatory staff before giving a definitive answer.

A subsequent letter, dated 1 December 1992, stated in part "..able to confirm that the Department's Regulatory staff will endeavour, to the extent possible, to provide equitable treatment to all licensed services whether they be paging, amateur or whatever." It further emphasised the expectation parties would negotiate problems "..and the Department would lend its support to any equitable outcome that conformed with the rules prevailing at the time."

In addition, the letter also addressed the matter of filters for sideband noise reduction and sought to explore with the WIA an in-principle agreement with the major paging service providers for the provision of notch filters in pager transmitter outputs, at the amateurs" expense, should the necessity arise in the future.

The implication here is for a negotiated solution where both the pager transmitter and a co-sited amateur repeater both meet their specification requirements, yet pager sideband noise interference persists. This proposal mirrors the WIA's initial submission on pagers in mid-1991. Naturally, being an in-principle decision, binding upon the whole WIA, it will need to go to the Federal Board for consideration.

(iv) Consideration to existing occupants and users when resolving compatibility problems on sites.

DOTC confirmed their frequency assignment and compatibility assessment procedures are based on the concepts of providing equitable spectrum access and treatment, consistent with the exercise of a duty of reasonable care, to all spectrum users. They were able to confirm that pre-existing licensed installations are taken into account in the assignment process. However, they did advise there may be need to negotiate sometimes, for frequency assignments were dynamic, rather than fixed forever.

DOTC provided a copy of draft RALI Endorsed Assignment Models, Software and Procedures.

Resolution of problems

The draft RALI mentioned above supplements the technical requirements of the specific RALI on pagers as to the problems with assignments. The implications from them for pager-amateur interference situations appear to be as follows:

(a) If a site intermodulation product interference situation arises, often called third and fifth order intermods, DOTC should be asked to check the assignment using either of the approved computer models CHANEL (V3.0) or LYNX and recommend an appropriate solution.

(b) If crossmodulation arises, the RALI *Adjacent Service Compatibility Criteria,* which sets permissible frequency- separation distances, should be checked by DOTC.

(c) If pager sideband noise interferes with the co-sited amateur repeater and both the pager and the repeater are operating within specification, a notch filter, inserted in the pager transmitter output and tuned to the repeater receiver frequency, should be trialled by the District Radio Inspector (DRI). If this removes the interference, the WIA recommends the repeater licensees have a commercial filter fitted at their expense to maintain good relations and restore use of the repeater. It is emphasised the pager operator is under no obligation to take any action.

ar

Random Radiators

Ron Cook VK3AFW
Ron Fisher, VK3OM

The AR Single Coil "Z" Match

Since we published our description of the 'Rononymous' "Z" Match in Random Radiators in the March 1990 issue of Amateur Radio, many of these units have been constructed with quite a bit of success. It seems that our message about the advantages of using a balanced line feed system to a centre fed antenna is really getting through. Without doubt, this is still one of the best approaches to the construction of an all-band antenna.

However, one of the practical problems in building the "Z" Match is the construction of the two coil sets. We believe many amateurs were discouraged from building the "Z" Match because of this. Well, help is at hand, read on for details on how to construct the new AR single coil "Z" Match.

Firstly, a bit of history. The idea of the single coil "Z" Match was first suggested in the New Zealand amateur magazine, "Break-In" for March 1992 by TJ Seed ZL3QQ. The article was more of a theoretical and mathematical run-down on how the thing should work. There was very little practical information on just how one should go about building one. Well, we decided to take up the challenge, get one up and working, and compare its performance with the standard "Z" Match.

So far our resident constructor has built up three versions and all produced very satisfactory results. All of the prototypes were passed on to Lloyd Butler VK5BR for his thoughts and suggestions and so the final model was constructed. Even this one is open to some slight changes which we will cover later in this article. According to Lloyd, the single coil "Z" Match is easy to get working on 160 metres, and this should interest many amateurs. Lloyd will present this information along with his complete findings on the single coil "Z" Match in the near future.

In the meantime, we will give you

details on the construction of a coil that will enable the "Z" Match to cover a range of 160 metres to about 15 metres, an option we think might prove popular. In its normal configuration, our "Z" Match is designed to cover the full range between 3.5 and 30MHz. Its operation is by no means confined to the amateur bands, and it's a very handy feature to be able to tune up on all frequencies for excellent short wave listening.

Another bit of history that turned up while we were investigating the single coil "Z" Match, was an article which appeared in AR for Oct 1953 by the late Joe Rogers VK3TO. This described an all band tank circuit for transmitters which bears a striking resemblance to our single coil "Z" Match. It is, of course, designed to couple a high impedance valve final amplifier to a low impedance output circuit. Not quite the same as an ATU which must transform a wide variety of impedances to the 50 ohm output of a transceiver. Nevertheless, it demonstrates the old saying that nothing is new under the sun.

As shown in the circuit of the ZL3QQ ATU, the 50 ohm output was taken from the top of the coil. Our experiments show that this is definitely not the right place, and that a much better matching range can be achieved by tapping the output well down the coil.

One of the big advantages of the single coil "Z" Match is that there is only one output link. The old one had two and this required switching. We now have two controls only to cover the full range from 3.5 to 30MHz.

The output coupling coil also plays an important part in the range of impedances that can be matched. The single coil "Z" Match shown in the illustrations is in fact an early version with the coupling coil wound directly over the earthy end of the main coil. After the photos were taken, we discovered better results could be had by winding the output link on to a short section of plastic pipe which was slipped over the earthy end of the main coil. The earlier version will work well, but with a slightly limited matching range.

Putting it all together.

If you are still with us up to this point, you might be prepared to go ahead with construction. It's a good weekend project and you will finish up with a better ATU than many commercial units costing two or three hundred dollars. You will need the following components: one two-gang variable capacitor with a maximum capacitance of about 350pF. For use with a standard HF transceiver of about 100 watts output, a 1950s style broadcast tuning capacitor is ideal.

You can often pick these up for a couple of dollars at a radio club buy and sell day. If you intend to run the full 400 watts then you will need a capacitor with wider plate spacing, designed for transmitting. These are not quite as easy to get hold of, but, given time, we are sure you will track one down.

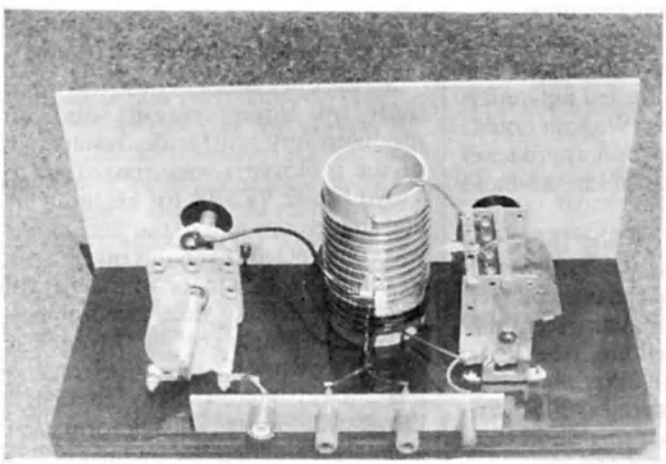
Next, one single gang capacitor with a maximum capacity of about 350pF. Again, a single gang broadcast type of about 350pF is fine. The one shown in the illustration is an English Eddystone capacitor with 250pF maximum capacity.

The coil is wound on a scrap piece of plastic water pipe. This has an inside diameter of 50mm and an outside diameter of 53mm. Your friendly local plumber should be able to supply you with more than enough to do the job from his rubbish tin.

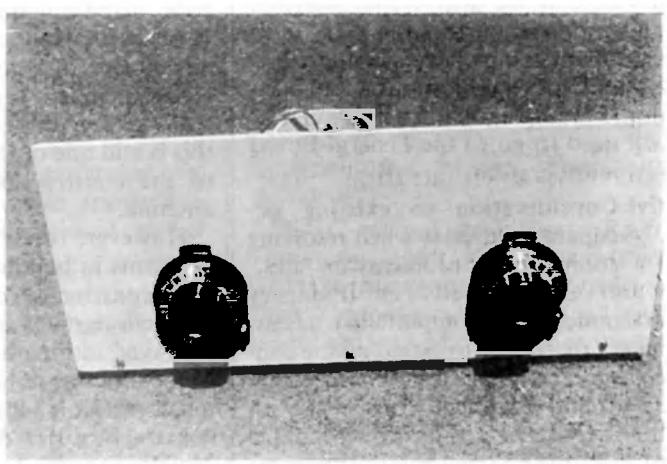
If you elect to wind the output coupling coil on a separate former you will need another piece of plastic water pipe with an inside diameter of about 60-65mm. You will need 100mm length for the main coil and about 55mm length for the coupling coil.

The coils are wound with 14-18 swg tinned copper wire. The heavier wire will give better overall efficiency, but the lighter wire is easier to wind. You will need about four metres of wire to do the job. Our prototypes were built on a wooden baseboard with a masonite front panel. However, if you can run to it, a metal cabinet is recommended. Under some conditions you might get a slight "hand capacity" effect with the wooden construction.

Again, we recommend the use of vernier drives for the tuning capacitor and the Dick Smith H-3900 are ideal. Three terminals and an SO-239 coax connector complete the inventory.



The works of the "AR" Single Coil "Z" Match. Tuning capacitor on the right and loading capacitor is the left. Note the output coupling coil wound over the bottom of the main coil. See text for comments on this.



Front panel view of the "AR" Single Coil "Z" Match.

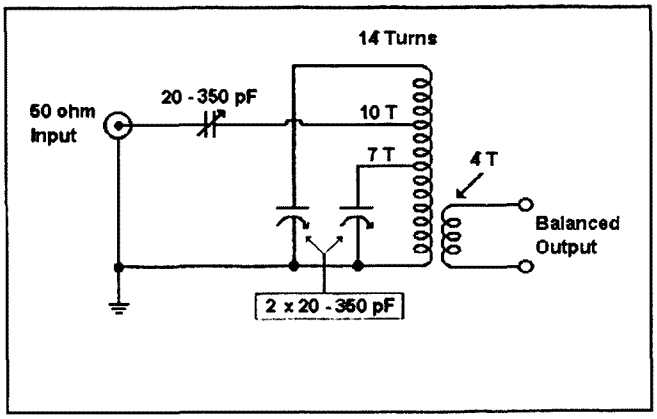


Fig 1 — The "AR" Single Coil "Z" Match.

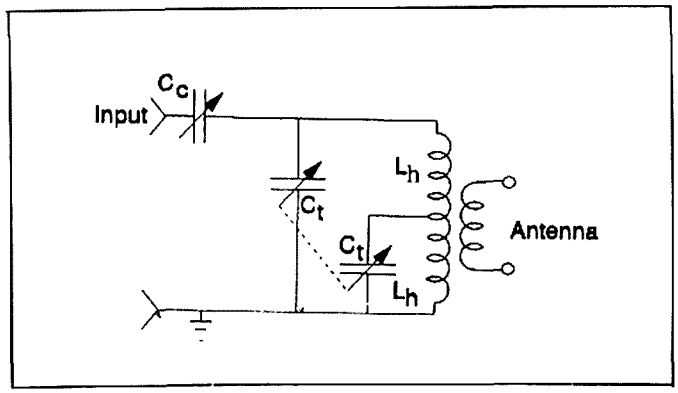


Fig 2 — The Single Coil "Z" Match as described in NZART Break-In, March 1992.

Winding the coil

The main coil requires 14 turns spaced over 80mm. Winding these on to the plastic water pipe is not as easy as it looks, and we suggest the following method:

Firstly wind your coil on to a smaller former, say about 40mm in diameter. When you remove it from this, it will spring out to about the required diameter. Secure the top and bottom of the winding through holes drilled through the former and then run some Araldite (TM) down the winding in a couple of places to hold the wire in place. We also cut a slot in the former about 50mm long and 10mm wide to facilitate the connection of the two taps. Unless you want to experiment with different tapping points, we suggest you leave this out.

General construction points

Layout of the single coil "Z" Match is quite straightforward and no particular precautions are needed except to keep the connections between the coil and the two gang capacitor as short as practical. While the unit will be earthed via the coax to the transceiver, we recommend a separate earth connection to your usual station earth point. This is more important if you are using the ATU to feed a single wire antenna such as the W3EDP we described several months ago.

To feed either a single wire antenna or coax-fed antenna, just ground one of the antenna terminals and make your antenna connection to the other.

Again we recommend a metal cabinet or, if you cannot run to this, a metal panel would be a good idea. This, of course, should be connected back to the earth terminal.

Tuning up and general operation

Using the AR Single Coil "Z" Match with an extended double Zepp for 40 metres, tuning was very smooth and easy on all bands from 80 to 10 metres, including the WARC bands. For receive only, it also peaked up nicely on all of the shortwave broadcast bands. For use with a transmitter or transceiver, you will need a reliable SWR meter, and, if you are really keen, you might want to build one into the ATU itself.

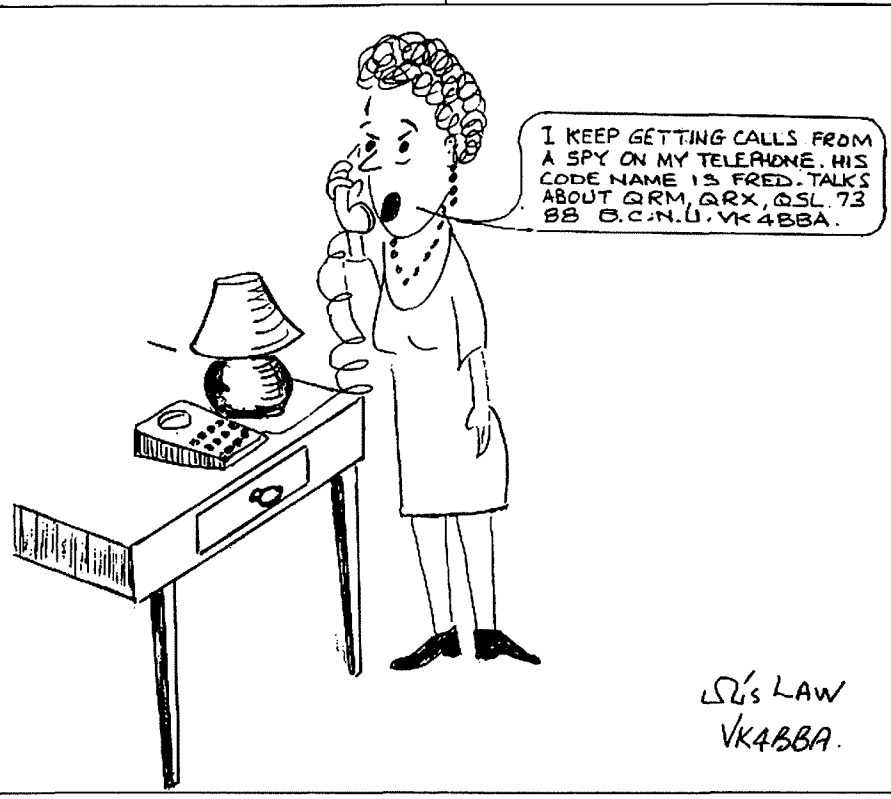
Compared with the old two coil "Z" Match we noted very little difference in performance, however, we will leave the technicalities to Lloyd Butler when he presents his full technical review of the new single coil "Z" Match.

We think that overall it has some significant advantages over the old standard "Z" Match. The most important is the ease of construction; secondly, easier operation, because the output coupling does not require switching.

Build one up; we know you will be delighted. So it's goodbye from him and goodbye from me.

The Two Rons

ar



Equipment Review

ICOM IC-R7100 VHF-UHF Receiver

Paul McMahon VK3DIP,
47 Park Avenue,
Wattle Glen 3096

The IC-R7100 is a wide band (25-1999.9999 MHz), multi-mode (AM, FM, SSB), receiver with scanning ability. Price Class AUD2000. The review set had serial number 01078.

First Impressions

The receiver comes in typical cardboard/foam packaging which can be retained for re-use as a transportation carrier. Included in the package are both 13.8V and mains power cords, Instruction Manual, Schematic Diagram, and a bag of miscellaneous bits including 4 x 3.5mm earphone plugs, 2 RCA plugs, 6 fuses, and a number of screws. Unfortunately the review set was missing the DC power cord, and schematic, however this is undoubtedly due more to "path losses" as the set made its way to me, rather than any problem at ICOM.

The set, in size and shape resembles a modern "mobile" HF box, but without the heat sink sticking out the back. A single large tuning knob, reasonable size S-meter and typical multi-function frequency/mode etc readout dominate the front panel. Two other knobs for volume, squelch, and innumerable buttons fill out all remaining space.

The S-meter is a standard analogue type with markings at S0-9, 20, 40, and 60 dB. All controls are well spaced out and easy to use, with only a minimum of buttons having more than one function. The manual (A4 size with no small print) is some forty pages and describes in easy stages what each button is, how to connect power, and antenna, etc. It also contains a large warning about the privacy of radio communications.

The back panel in contrast is virtually empty. It sports a single "N" type socket for antenna connection, AC (IEA) and DC (as for IC22S) power sockets, four 3.5 mm phono sockets for such things as computer control, tape recorder, external speaker etc. There are two RCA sockets for the optional TV-R7100 which allows Video and Stereo FM broadcast reception. The TV-R7100 option was not available for test.

Initial set up was quick and painless, and basic operation was relatively straightforward. Put in a frequency via the keypad, press enter, select a mode and there it was. The main dial also could be used. I would be interested to know how many people (as did I) when trying to think of frequencies to try, come up with commercial FM broadcast ones.

Audio quality was good with plenty of volume available. It would take a brave person to advance the volume control past half way when listening to a broadcast FM station, the built-in speaker not quite being of "ghetto blaster" calibre. While on the subject of the audio one thing noticed at this stage was the confirmation beep, ie every time a button is pressed etc a beep is heard. Be careful, this obviously comes through the normal audio path including volume control. If you have been listening to a quiet station with the volume turned up, it can give you a bit of a start when this now very loud beep comes up when you press a button. The manual details how you can turn the beep off, or adjust its level (internal adjustment). In the review receiver this level was set a bit too high for my liking.

Technical Bits

An extract from the specifications for this receiver are given at the end of this review. As can be seen these are quite good; the frequency coverage is very wide and all modes (save an explicit CW one) are available with varying bandwidths. While no information is given on inter-modulation etc no particular problems were experienced in this area.

In terms of sensitivity and selectivity the receiver is on a par with, or better than, most equipment in current use. It is possible to find some equipment with marginally better specifications but they are not all that common. The true test of course would be in terms of dynamic range, image rejection, and inter-mod and unfortunately these figures are not provided with the set. Also unfortunately the requisite test equipment to get accurate answers in these areas was not available to me, likewise the time available for this side of the review was, for various reasons, quite short.

On all my subjective tests however, and on those of others who own this set, the receiver performed very well.

As a fox hunter, some items that are of particular interest to me are the accuracy of the S-meter and the intrin-

sic shielding and effectiveness of the attenuator. In my tests the S-meter was about average, ie the numbers are only to serve as a guide. There was about 20 dB between 40 and 60 dB over, however there was only about 10 dB from S9 to the 20 dB mark. This appeared to be consistent across the frequency range, as was the effect of the built-in 20 dB attenuator, though this was difficult for me to test properly above 1 GHz. The shielding also appears to be on a par or better than many other rigs. Two watts from a hand held one metre away, with the receiver terminated with a 50 ohm load produced only an S9 signal. In this test the attenuator had little effect.

An area of interest for a receiver with such a wide range is the possible presence of spurious responses or "birdies". It would be all but impossible to have such a good receiver without some problem of the receiver hearing itself. The ultimate test for this is easily set up, but is a problem in itself.

The receiver is terminated with a shielded 50 ohm load and scanning is set for the smallest step (ie 100 Hz) and off we go. The problem is that this is a very wide band receiver. There are some 19,750,000 frequencies to test. Even with the highest scan speed which was capable of a very sprightly 125 steps a second this amounts to 158,000 seconds, or nearly 44 hours from top to bottom. On a slower scan speed this could easily stretch to over a month, not something to be lightly contemplated! It is only figures like this that give you an idea of just how much spectrum this box covers.

After some effort I did manage to find at least one harmonic. Without a circuit it is impossible to be sure, however I am pretty certain that there is a 10.240 MHz oscillator in the box somewhere. This is evidenced by quite small spurs every 10.240 MHz with the first visible at 20.480 MHz, and some 190 odd others all the way up to 2 GHz. All are at a very low level. You probably wouldn't notice them unless you were looking for them, except for the one at 512 MHz which for some reason was S9 on the meter. 512 MHz is also the place where the first IF changes from high side to low side so perhaps this has something to do with it. There may well be others there but I didn't find them. On the whole this set represents a very impressive bit of receiver design.

Operation

The operation of the rig is straightforward from the instruction manual, however some time should be taken in examining the various scanning options. Scanning is the single largest chapter in the manual, by a large margin. Scanning options include 5 basic scan types with a large number of variations using combinations. The 5 basic types are:

- Programmed scan, ie set from and to.
- Memory scan, ie scan memories.
- Selected Mode Memory scan, ie scan memories that have the same mode.
- Auto Memory Write scan, ie as a frequency is found write it to memory.
- Window Scan, ie hop between the two windows.

The Auto Memory Write is a neat feature. Memories 800-899 are available to be automatically written to as active frequencies are found. These can then be reviewed at leisure. Considering the sorts of times mentioned before this is the only practical way to scan large chunks of spectrum.

The set has 900 memories. Each memory stores frequency, mode, tuning step, and select number or skip channel. The select number is a way of tagging memories with a particular number which can be used in conjunction with the scan, ie groups of memories can be scanned. The skip channel for memories 700-799 can be used to specify frequencies which are to be skipped in a scan.

As well as these scanning functions the set also has a clock and timer ability to enable unattended operation at particular times. Also the set has two so called windows which allow such things as having a scan active in the background window, while doing something else in the foreground. Again the manual explains all, however there is probably no substitute for time spent at the controls.

Operation of the controls is basically straightforward, with the only thing I found a bit tricky being the use of the main tuning knob in conjunction with some of the buttons. For example, changing of memory channels is done by holding down the MCH button while rotating the main tuning dial. The squelch control is particularly simple having a combined, noise and level action. The first 25% of its travel affects a noise squelch level, while the rest affects a signal level squelch.

The FM centre indicators and AFC are novel and useful additions. The FM centre indicator performs a similar function to a centre discriminator meter showing whether tuning is above or below the centre frequency. The AFC action is quite interesting to watch, the frequency can be seen to change by itself as the set tries to lock in on a signal. Sideband tuning with only 100 Hz steps and no RIT takes a bit of getting used to but does produce acceptable results in the end.

One feature, that I didn't have enough time with in order to judge its effectiveness, was the voice squelch system. This system is intended to be used in conjunction with scanning, allowing the radio to move on if no

The versatile ICOM IC-R7100 VHF/UHF All-mode Communications Receiver.

modulation is found on a particular frequency even if a carrier opens the mute. Likewise I didn't have a chance to try out the computer control features, however I will say that if you do intend to use this feature I hope your computer is a lot quieter on the air waves than mine, because I can guarantee you that this rig will find your computer on lots of strange frequencies.

Conclusion

This is a very good radio, and ideal for the exploring of the vast spaces out there between the ham bands a la Star Trek. If you do happen to want to use this rig or similar in this manner I would however recommend that you also invest in one of the many frequency listings available, or even just a spectrum allocation chart such as the one that used to be available from DOTC.

Even as just a Ham Bands set this receiver would have much to recommend it.

Rumour has it that in the US this radio is hard to come by because a particular US Government agency has purchased several thousand of them. Which is probably about the only way I would ever get to own one, ie as government surplus. Oh well, one can dream! While on the subject of dreaming there are a couple of ideas that I have had for this and similar rigs.

Firstly the predecessor to this radio (the IC-R7000) had an infra-red remote control. The IC-7100 does not. I think this would have been nice to have in this model too. Perhaps this is just microphone envy on a receiver, however something with just up and down buttons or a keypad would be a help.

Secondly, and I should say in common with most radios these days the serial number on the back of the rig doesn't really help as an anti-theft measure. Being on a small plate held on with two small screws it is no deterrent at all. Perhaps it is time that ICOM et al put in features similar to those found on some car cassette radios.

I for one wouldn't mind having to enter say some 8 digit number every time I powered up the rig, if it meant that if someone was to steal it, that the radio would not function until the secret number I had set was used. Likewise electronically personalising the radio with my call, or driver's licence number locked with this password, would do much more for the resale value than engraving the new $2000 rig with a vibro-etcher. It is not as if there was a shortage of room in the microcontrollers on the rigs these days. You may have heard of one rig that has, as well as its normal features, a special games mode for a space invaders style game on the multi-function display. I for one would rather have the security features than a game.

IC-R7100 Specifications (abridged)

Frequency Range: 25 — 1999.9999 MHz (Specs Guaranteed 25 — 1000 MHz and 1240 — 1300 MHz)

Frequency Steps: 1 MHz, 100, 25, 20, 12.5, 10, 5, 1, 0.1 kHz.

Antenna Impedance: 50 ohms Unbalanced.

Power: Built in Mains 100, 117, 240 VAC , or external 13.8 VDC.

Current Drain (13.8 VDC) : Squelched 1.5A , Max Audio 1.9A

Audio Output: 〉2.0W

Modes	USB	LSB	AM Normal	AM Wide	FM Narrow	FM Normal	FM Wide
Selectivity (kHz at -6dB)	〉2.4	〉2.4	〉6	〉15	〉6	〉15	〉150
Sensitivity (μV for 10dB S/N or 12 dB SINAD*)	〈0.2	〈0.2	〈1.6	〈1.6	〈0.35	〈0.35	〈1.0
IF(MHz)	25-512		512-1025		〉1025*		
1st(MHz)	778.700		266.700		25-1025		
2nd(MHz)	10.700		10.700		778.7 or 266.7		
3rd Not for WFM(MHz)	455 kHz		455 kHz		10.7		
4th Not for WFM	-		-		455 kHz.		

* A Crystal Converter system is used above 1025 MHz.

Dimensions: 241(W) x 94(H) x 239(D)
Weight: 6.0 Kg

ar

Technical Abstracts

Gil Sones VK3AUI

Interference Reduction

A noise reduction system which allows noise or interference to be cancelled out or nulled has been described in Rad Comm April 1992 and September 1992 issues. The author Trevor Day G3ZYY provided details for use on both 2 and 6 metres as well as for the 4 metre UK band.

The idea is not new but the unit is neat and simple to build and is capable of good performance. The components are all either available locally or suitable equivalents can be purchased locally.

The idea surfaced many years ago as the "Jones Noise Balancing Circuit" in the Radio Handbook. Since then Drew Diamond VK3XU has published a design in AR Oct 1976 and Lloyd Butler has published a design for HF in AR Sept 1992, with a further article as recently as the January 1993 issue. Seems a good idea goes on and on.

The block diagram is shown in Fig 1. The unit has preamps for both the

main antenna and the noise or sense antenna. The noise path has variable phase delay lines of miniature coaxial cable which are adjustable with switches. The coaxial cable used type RG174 is available from a number of sources. Alternatively small diameter teflon coaxial cable is widely available. The gain of both paths is adjustable with one being preset and the other varied to achieve a null.

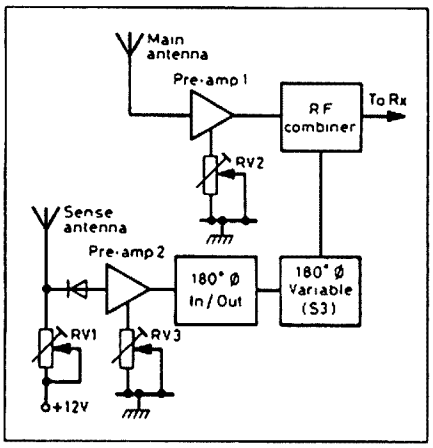


Fig 1 The two signal paths are combined via a phase-shift network.

Adjustment of these types of noise reducer is a multi knob affair as both phase and amplitude must be varied to achieve a null. They are useable for noises such as computer hash and power line noise or desense from a strong local signal.

The circuit diagram is shown in Fig 2. This circuit is of the 2 metre model. For 6 metres connect the sense antenna direct to VC3 and dispense with

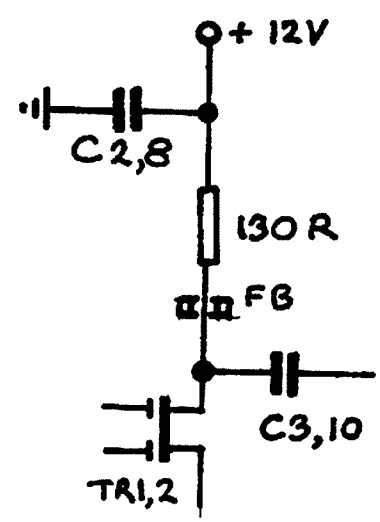


Fig 3 Six metre drain circuits of MOSFET preamps.

C6,R6,RV1,& D3. Values for both 6 and 2 metres are given in Table 1. For 6 metres use Fig 3 for the preamp drain circuits. The FETs used may be strange but any low noise MOSFET should do the trick. Types to consider would include 40673, BF981 etc as all that is needed is a low noise preamp for the band. Alternatively a pair of kit preamps could be used.

The variable phase delay switch and PCB layout is shown in Fig 4. The coaxial cable phase delay section lengths are given for both bands in Ta-

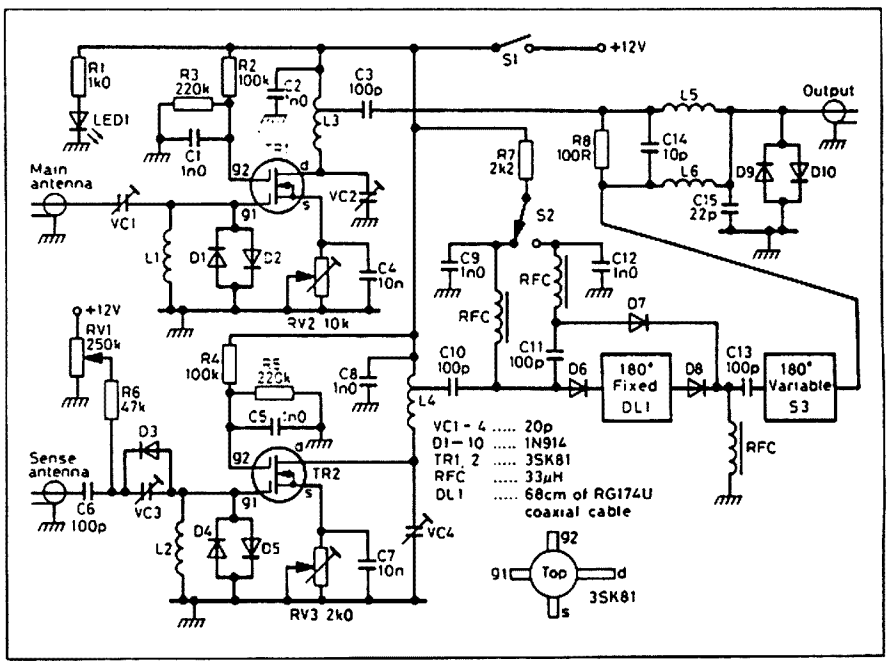
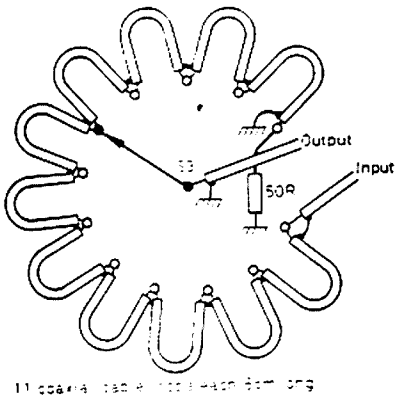
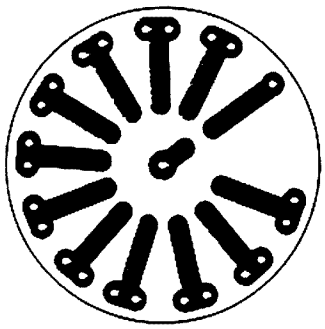


Fig 2 Circuit diagram shows how signals from the two antennas are amplified in a variable gain MOSFET configuration.

Table 1

Component	2 Metres	6 Metres
L1	8T 18 SWG 4.5mm ID	10T 22 SWG 4.0mm slugged Former 13mm long Iron Dust Core
L2	8T 18 SWG 4.5mm ID	10T 22 SWG 4.0mm slugged Former 13mm long Iron Dust Core
L3	8T 18 SWG 4.5mm ID 13mm long Tap IT	Not Used see Fig 3
L4	8T 18 SWG 4.5mm ID 13mm long Tap IT	Not Used see Fig 3
L5	8T 18 SWG 6.5mm ID 19mm long	8T 22 SWG Air Core Self Supp.
L6	8T 18 SWG 6.5mm ID 19mm long	8T 22 SWG Air Core Self Supp.
	18 SWG is 1.2mm approx	22SWG is .7mm approx
C3	100 pF	270 pF
C10	100 pF	270 pF
C14	10 pF	33 pF
C15	22 pF	64 pF
C6	100 pF	Not Used
D3	1N914	Not Used
R6	47K	Not Used
RV1	250K pot	Not Used
DL1	68 cm RG174	198 cm RG174
DL var S3	11 x 6 cm RG174	11 x 18 cm RG174
VC1 & VC3	20 pF trimmers	20 pF trimmers
VC2 & VC4	20 pF trimmers	not used see Fig 3





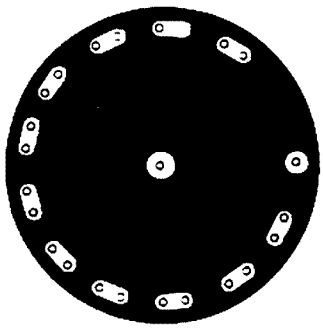


Fig 4 Coarse adjustment of phase uses a 12 way switch fitted on a double sided PCB carrier. Easier with a PCB mount switch.

ble 1. The PCB could be home etched and a Dalo pen would be adequate to mark it up. Suitable switches are locally available.

Setting up consists of tuning both preamps. Then set the main antenna preamp gain for a suitable signal level. The gain of the noise preamp is varied to assist nulling. Nulling is done by adjusting the phase controls and the noise preamp gain to achieve a noise null.

Both signal paths should be shielded from each other. Stray coupling may prevent a null. The original used PCB shields with the whole unit housed in a die cast box.

Transmit receive switching is up to you. It could be incorporated in the switching of an outboard Linear Amplifier. PTT can usually be found on an accessory connector on most radios. Alternatively try tapping it off from a mic plug and socket adaptor arrangement.

The separate noise antenna should be outside and oriented to receive a good noise signal. Some separation from the main antenna is desirable.

ar

Murphy's Corner

December 1992

RD Contest results — alterations

VK1
VHF Phone
VK1DI 211

VK5
HF Phone
VK5MD 124
VHF Phone
VK5KX 31
VK5MX 53
VK5BKC should read VK5BRC

VK6
VK6VSD should read VK6VS

Final Scores
VK1 51/246 should be 51/426

Late Entries

The rules state that summary sheets must reach RDCC by Friday 2nd October 1992. The following summaries were received after the closing date, and regretfully were unable to be included in the final compilation.
VK2CN, VK2SRM, VK3ADW, VK3AFW, VK3BYA, VK3GHA, VK3KAV, VK3TJA, VK3ZUG, VK4YZ, VK5PF, VK6ATZ.

To assist with the publishing of the results in the November issue of AR, for the 1993 contest it is proposed the closing date for the submission of Summary Sheets be three (3) weeks after the contest. This should not cause any problems, as a summary sheet and not a log is all that is required for this contest.

73 from Neil Penfold VK6NE

★ ★ ★

December 1992, and January 1993

10 GHz Record

Page 28, 10 Gigahertz Record Broken, the correct callsign of Max Chadwick in the photograph is VK3WOD, not VK3WAD. While we are about it, in the January 1993 issue, Murph started the new year well. On page 9, the photo caption of VK3BBU should have read Mal Crew. Apologies to Max and Mal (is that ever confusing !!)

★ ★ ★

January 1993

Info on Rotators

We apologise to Lindsay Collins VK5GZ whose name and call-sign were omitted from the heading of his article on page 21.

★ ★ ★

January 1993

More on Interference Cancelling and a New Circuit.

More apologies to Lloyd Butler VK5BR. Through no fault of his own, Lloyd has become a regular contributor to this section. In figure 2 on page 20, in his circuit diagram R4 the source resistor of the MPF102 (V1) should show as 1000 ohms (1K), NOT 100K. Also the antenna transformer should be labelled T1.

VK3UV
AR Production Editor
ar

Tuned Feeders — Who Uses Them?

Robert R McGregor VK3XZ
2 Wiltshire Drive
Somerville 3912

EXAMINE THE PRESENT scene. Any antenna system where there is some form of reactive matching including autotune systems between the transmitter output and a feeder system is a tuned one whether coax or parallel lines. A pair of parallel lines matched to the antenna is an untuned system. The use of a tuned circuit as a coupling medium is not tuning the antenna. Ask anyone who has used a correctly set up single wire-fed Windom. Solid coax is the most expensive and inefficient method of coupling to an antenna. It has low tolerance for standing waves. It is very convenient in many situations. Enjoy the free choice that is such a stimulating part of amateur radio.

The full benefit of using an antenna with tuned feeders is not always recognised. The whole system is resonant at one frequency, and all the standing waves are in their correct positions. The ones on the feeders are balanced for minimum radiation and those on the radiation portion of the antenna to provide maximum signals in and out. The low losses of open wire feeders ensure maximum Q for the system, and there is less signal spread or out-of-band pick-up. If inductive coupling is used to the transmitter there is an additional reduction in harmonic radiation.

In general series tuning is easier and there is less RF voltage in the shack. Additional lengths of line can be added in series to shift the nodes — you are in control. It is not essential to have a condenser in each line as the series tuning/coupling coil can be split and a single condenser connected in series at this point. Both plates are hot. A broadcast two gang can be used as a single section, two in parallel or with the sections n series — this will usually cover from 10 to 160 Mx. Always put a drain resistor from each feeder to ground, 100 K is fine, 3 x 33 K 1/2 W in series. For earthing use a simple earthing stick. A wire hook on a stick with a lead to ground hung from a loop soldered or twisted on the feeder.

The coax output socket is connected via a short jumper to the SWR meter, and another is terminated in a coupling coil to suit the antenna tuning coil. You adjust size and turns to suit. This coupling coil can be fixed in position and terminated in a socket for simpler coil or antenna changes. On 80 and 160, a judicious selection of the feeder length can provide part of the series inductance to tune the system. Should there be a pair of roller inductances in the junk box, place one in series with each feeder and dispense with the condenser.

Marconi and fellow experimenters discovered the benefits of tuning the antenna. Telefunken showed that loose coupling gave a cleaner and more readable signal. It was mandatory for years that the transmitter was not direct coupled to the antenna. I wonder if that ruling still exists?

ar

Try This

Info on Pulley

Lindsay Collins VK5QZ
12 Park Avenue
Rosslyn Park SA 5072

A HANDY DROP-IN pulley for top of rotator pipe to assist lifting, holding in rough position while one man bolts the boom to the mast. I have even used it to drop one side at a time of the driven element of the TH6DXX, for alteration to its lengths.

The rope is manhandled from the ground.

ar

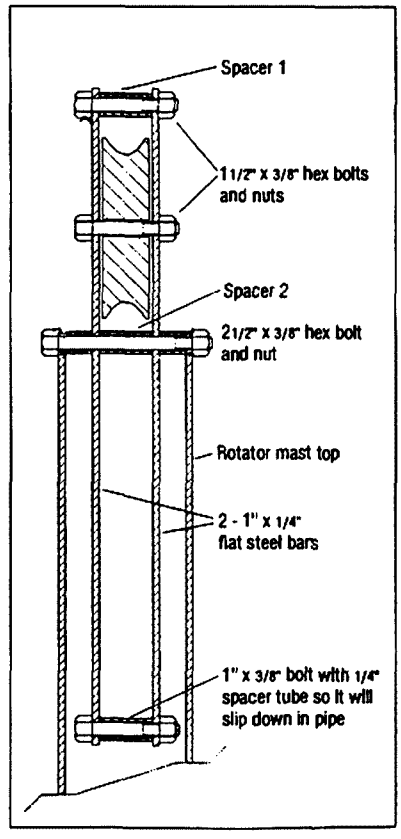


Diagram of the Rotator pipe installation.

VHF/UHF An Expanding World

Eric Jamieson VK5LP PO Box 169 Meningie SA 5264

All times are UTC

80 — 54 MHz DX Standings

DXCC Countries based on information received up to 20 December 1992.

Crossband totals are those not duplicated by two-way contacts.

A callsign cannot be displaced from its existing position except by another with a higher confirmed number.

Column 1: 50/52 MHz two-way confirmed contacts

Column 2: 50/52 MHz two-way claimed as worked but not confirmed

Column 3: Crossband 50/52 MHz to 28 MHz confirmed

Column 4: Crossband 50/52 MHz to 28 MHz worked

Column 5: Countries heard on 50/52 MHz

Callsign	1	2	3	4	5
VK4ZJB	93	94		4	
VK3OT	91	91			
VK4BRG	85	87			
VK2QF	83	84			
VK4ALM	68	70			
VK4ZAL	67	68			
VK2BA	62	63		4	
VK8ZLX	45	60		1	
VK3AMK	45	47			
VK6HK	45	45			3
VK8GB	42	42			13
VK5RO	39	48		3	
VK6RO	39	39		1	10
VK3AWY	34	36			
VK3AUI	34	35			
VK5LP	34	36			9
VK3NM	31	34			
VK5BC	29	63			
VK2DDG	25	26		2	13
VK4KHZ	23	34			
VK3XQ	23	25			2
VK6PA	35	57			
VK4TL	22	23			
VK2KAY	21	23			
VK2BNN	20	21			
VK9LG	20	20			
VK7JG	20	22			2
VK4BJE	19	25			
VK4KAA	19	20			
VK3TU	17	19			
VK2ZRU	16	19			4
VK4ZSH	16	16			
VK2ZSC	16	29			
VK9LE	14	14			
VK6OX	10	10		1	
VK5KL	06	11		1	6
Overseas					
JA2TTO	48	48			6
YJ8RG	25	25			

The next list is planned for the August 1993 issue. Copy, additions or alterations to me by 20 June 1993 please.

As in the past, where I believe a situation determines, I reserve the right to seek such clarification as may be deemed necessary, for any claimed QSLs. In the meantime, I thank those contributors who continue to support their claims with photocopies of QSLs or have them certified by other amateurs. It helps!

Countries worked from Australia on six metres

The first list was published in November, a list with many corrections in December, then a few corrections in January, now in February there are some more adjustments, which tends to illustrate that the list should now be more accurate. If you believe something should be altered please send details of callsign worked and by whom, date, time and mode.

The adjustments this month are: 3D2SM from VK4BRG to VK4FXX (VK4FP); 9M2DQ date change from 26/09/58 to 26/09/59; add CX4HS Uruguay (new country) 16/04/92 VK4FP; DL8HCZ change from VK8ZLX to VK8GF; HK0/W6JKV change to 01/04/92, VK2QF; I2CCD change to 14C1L, 15/02/91, VK4FP; IS0AGY change from VK4JH to VK4FP; KG4SM change to 25/03/89, VK2QF.

A very early log

Jeff VK8GF, amongst other things, recently sent me copies of a few pages from the log of his late father, Max Farmer VK5GF, who first came on the air in 1934. It was of interest to note that his first contact was with VK5LP on 24 January 1934! No, it was not me, but according to my 1937 Call Book, the callsign of LV Phillis, 5 Luhrs Road, South Payneham, a suburb of Adelaide. The contact was on 40 metres at 2230 local time with signal reports of 5x7 and 5x8. According to the QRI, Max used a crystal controlled transmitter and VK5LP one noted as PDC which I seem to recall means "pure direct current or pure DC" ie one without an obvious AC component.

I am trying to establish when Max first worked on five or six metres, most likely pre World War II. His first six metre contact with New Zealand was ZL2MF on 21/12/47, signal reports being 4x3 and 5x8/9, quite a variation but Max may have had the better station. This contact would have been made at a time somewhere near the peak of Cycle 18.

WIA QSL collection

Ken Matchett, the Hon Curator of the WIA QSL collection, advises that the collection contains no fewer than ten MD5 cards, all from British Forces personnel, Army, RAF and Royal Signals, stationed in the Canal Zone following World War II. Ken also said that the collection contained over 280,000 QSL cards!

Six metres

Mike Farrell VK2FLR says in a letter which arrived just too late for last month, that since April, six metres in general has been poor at his QTH of Glebe Point. His March/April workings included V73AT, K6ST1, WA6BYA, K6FV, T30JH, 3D2AG, V31PC, XE2EB, ZF1RC, KG6UH/DU1, 3D2AG, XE1GE, N6AJQ, V85PB, KG6DX, JAs and heard KC6RR. All VK states on backscatter, especially VK6PA on F2 backscatter. He managed a contact with N4XIH in Florida which was the eastern-most contact into the US.

Word comes from **Adam VK3ALM** formerly VK3YWV, expressing surprise in the number of countries collectively worked from Australia on six metres. He said he has had a six metre rig since 1983, but fell into the trap which awaits so many newcomers to the band — listen around for a while, don't hear much, then give it away! He finally came back during the later part of Cycle 22 and worked and confirmed 11 countries.

Adam says that the only way to obtain a QSL from Tim V73AT is via his QSL manager: Charles Lloyd K2CL, 30 Crow Hill Road, Freehold, New Jersey, 07728, USA. Tim is presently signing N2PC/0 in Colorado, where there is 30 cm of snow, quite a change from his tropical island!

Adam VK3ALM reports a good opening to KH6 on 19/12 commencing round 0150 and continuing until 0300. He first heard the KH6HME beacon, then worked KH6IAA and KH6HH. Shel NI6E/KH6 was also there but having worked him before, Adam left him for others less fortunate. Shel was heard to say that he had worked stations in VK1,2,3,5 and 7, with signals to 5x9. Other VK3s to work KH6 included VK3XQ, AMK, ATN, AZY, BDL, BOB, CJS, DUT and DUQ. The KH6s appeared again on 20/12 for about ten minutes from 0245.

Nev VK2QF reports quiet conditions. On 18/10 between 0230 and 0430 he worked JA1,2,3,4,6 and 9, HL9UH, VK9WW (Willis Is); 28/10: JA1,2,3,4,5 and 9, HL9UH, N7ET/DU7. Between 1/11 and 23/11: ZL4AAA, JA1,2,7,8 and 0, ZL2TPY. QSL route for N7ET/DU7 is Dale Law, Silliman University, 6200 Dumaguete City, Philippines.

In response to my request, **Steve VK3OT** has forwarded a copy of his log for November and December 1992. During November

he worked 62 stations in Japan, and 25 in December, working into all districts except 9. There were extensive openings on 7/11, 24/11, 15/12 and 24/12. He logged one or more JA beacons on no less than 22 days of the two months. Also heard was JH8ZND on 50.480 MHz.

Other overseas contacts by Steve include: 19/11 ZL1ANJ, ZL3NE, ZL2TPY; 24/11 ZL3AAU, ZL4OY, ZL3MHF/b; 27/11 XE1GE; 2/12 ZL3MHF/b; 5/12 ZL2KT, ZL3MHF/b; 14/12 ZL2AGI, ZL2KT, ZL3MHF/b, ZL2TPY, T30W; 15/12 BZ4SBN; 18/12 ZL3TIC, ZL2KT, ZL3MHF/b, ZL2AGI; 19/12 FK8DH, KH6IAA, NI6E/KH6, KH6HME/b, KH6HI/b, KH6HH, AH6LR; 20/12 ZL4TBN, ZL3MHF/b, KH6IAA, KH6HI/b, ZL4AAA, TI2NA (reported in VK3); 21/12 P29BPL/b; 24/12 P29BPL/b, ZL1ANJ, ZL2AGI; 27/12 P29BPL/b.

The above are included as an indication that, despite many gloomy reports, there are stations out there waiting to be worked, if you care to look for them.

Steve reports that the most consistent Australian beacon in VK4BRG/b which can be heard almost on a daily basis via Es, also, VK8VF/b and VK4ABP/b heard on 24/12. The P29BPL beacon churns away but there seems no one from PNG is available for working. Es contacts have been made to VK1RX, VK2JSR, VK2MZ, VK2QF, VK3AMZ, VK4AFL, VK4ALM, VK4BRG, VK4PU, VK4JH, VK4TL, VK4VV, VK4WHO, VK4WTN, VK5LP, VK5NC, VK6BE, VK6KRC, VK6KXW, VK6ZWZ, VK7DA, VK8GF and VK8ZLX.

On the local scene, VK5 has been belted again with a succession of storms and heavy rain leading to flooding. I cannot remember when so many thunderstorms have appeared day after day. When they threaten, all the antennas are disconnected to prevent static discharges from burning out the front end of the receivers — hence there exist extensive gaps in the notes in my book.

Of major interest to me has been the absence of JAs at Meningie when compared with the number being heard/worked by Steve VK3OT, 400 km south east of me, eg on 15/12 Steve had a very good day while it was quiet here. On 16/12 I had a good day while Steve reported very little. Strange!

While Es openings to VK4 are almost a daily occurrence, but not always with good signals, there seems to have been more openings to VK6 and ZL than usual, with the ZLs penetrating both to northern VK4 and to VK6. KH6 was in here on 19/12, while on 20/12 a good catch was TI2NA at 2330 by VK3AMK and VK2. On 21/12 the band was open all day to somewhere in VK, with ZL, KH6, JA and Russian TV on 49.750 to add to the fun. I was not surprised to hear that VK4JH had worked ZL on two metres. On 22/12 there was a report of TI2NA working a VK5. I heard the P29BPL beacon at 0100. On 23/12 strong ZLs at 0030 followed by VK2,4 and 7.

24/12 was interesting. At 0030 the band was open simultaneously to VK6 and northern VK4 but not Brisbane. VK6BE in Albany was S9. VK4JH reported hearing the XE1 beacon; at 0200 four JA beacons were copied; at 0450 VK3OT was heard in conversation with VK1RX but only available at 15 degrees! 0500 found VK6BE, VK6JJ and VK6ZWZ, then at 0415 it swung back to VK4AFL and VK3MZ. 0548 VK4KU to VK9NS, then a broad coverage from VK8VF/b, VK4, VK2, and ZL. At 0600 VK3DUT was heard working VK4KAA while JAs were on the band. At 0843 VK6KJQ, VK4KK, VK4KU, VK7ZMF. At 0909 VK8ZLX was strong at 42 degrees ie side-on!

I was away on 25/12 but was told VK4 had worked VK7ZMF on two metres, which is not surprising considering the short skip to VK3 from VK5. On 30/12 at 2320 VK5BC worked ZL1ANJ and a ZL4 at 589. At 2340 VK3XRS was 5x9 but nothing on two metres. VK4ZAZ was 5x4 but VK4ALM managed 5x9.

31/12 at 0100 ZL4s again, at 0130 short skip to VK3TJA and VK3KK.

Turning the page, on 1/1/93 at 0120 ZL2UBG and ZL2AQR. At 0340 ZL1 and ZL2. At 0420 VK4s were heard working VK6WD followed by VK6s working ZLs. This was good to hear as they do not often have such a long path. I was magnanimous and let them have the contacts!! At 1009 VK4ZDK had a good path to VK7ZMF. After that it went a bit quiet here, with the occasional VK2s and VK4s, but nothing further afield. Overall, I worked what I wanted to, the remainder of the time being spent listening to others.

Jack T30JH is returning to Tarawa for a March/April stint, for the specific purpose of working a VK6 station. He will be making every effort to do so as he needs one to give him Worked-All-States. Jack asks those who have worked him before to please refrain from working him again!

Overseas news

Ted Collins G4UPS, sends a list showing the S5 callsigns issued to Slovenian stations with effect from 24/10/92. The list commences with S51AD and ends with S59ZZ and covers 152 stations formerly issued with the YT3, YU3 and 4N3 prefixes. The 4N3SIX beacon now signs S55ZRS.

Ted also included a list of the 82 EA stations that have received six metre permits from the Spanish PTT. These EA stations are obliged to use the EH prefix when operating on six metres. To 30/10/92 a total of 45 of these EH stations are reported to have been worked in the UK.

Chet Brandon **PJ9EE**, has packed away all his six metre equipment until the next cycle! Doug Woolley ZP6CW, is returning to the US, but has loaned his six metre equipment to the Radio Club of Paraguay and hoped that ZP5AA would be activated on the band. The ZP5AA beacon on 50.025 would remain operational. Doug worked 103 countries during his stay of two years.

Geoff Brown GJ4ICD, from Jersey says that in Europe there are 51 countries legally on six metres. European stations should be able to work these countries using Es propagation. Those which have not been activated include C31, 3A2, SV9, SV5 and HA but they may become available through dx-peditions during the northern hemisphere summer.

Geoff says that with the decline of solar flux levels, the liaison frequency of 28.885 MHz will eventually become unusable (outside Europe) so a new frequency has been established on 21.325 MHz. Time will tell whether it becomes necessary to resort to 14 MHz!

The bands above 50 MHz

Rod VK4KZR from McDowall, a Brisbane suburb, says regular contacts are made with Gordon VK2ZAB on 144.2. Also, on 14/12/92 he started a series of 144 MHz meteor scatter tests with Arie VK3AMZ and was able to complete an SSB QSO in 13 minutes. He used this mode last year for the Ross Hull Contest and the bursts were good enough to exchange full RST and serial number reports.

The only other DX activity has been the appearance of John VK4AUK, who is west of Maryborough and working into Brisbane with good signals on 144 and 432 MHz.

On 1296 MHz there is only local SSB activity. However, Rod is keen to pursue tests on any of the above bands, with stations outside the Brisbane area.

Closure

Well, it's been a mixed bag this month. There has not been a lot of correspondence so this means that people have not been working many stations, or have been too busy working them to write! In general, sporadic E has been just that, sporadic, nevertheless, there have been some very good days.

I am very pleased to observe that there are a large number of stations who QSY from 50.110 after initiating a contact, though a few are still content to hold QSOs on the calling frequency. It would be even more pleasing to see 50.125 used as an Es and local calling frequency, maybe it will become more so in the future.

Closing with two thoughts for the month:

1. Rumour is one thing that gets thicker as you spread it, and,

2. Every time we hear a disc jockey play the top 40 tunes, we get the shakes thinking what the bottom 40 must sound like.

73 from The Voice by the Lake.
ar

AMSAT Australia

Bill Magnusson VK3JT 359 Williamstown Rd Yarraville VIC 3013
Packet: VK3JT@VK3BBS

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z depending on daylight saving and propagation . Check-ins commence 15 minutes prior to the bulletin.
Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz (Usually during summer).
Secondary 3.685 MHz (Usually during winter).
Frequencies +/– 5 kHz for QRM.

AMSAT Australia newsletter and soft-ware service:
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Aust addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

ZRO tests:

With AO-13's apogees slowly coming further south and operating conditions getting better we should see renewed interest in this bird. For some time now it has been "in the northern hemisphere" for most of its time but for the remainder of its life, (maybe 3 years or so) we will be able to take part in many of the activities we became familiar with on AO-I0 before it went out of control. I mentioned "hog callers" and "alligators" last month. Fortunately the new generation of amateur radio satellites will have devices on board to discourage such practices. At the other end of the scale from these undesirable things we have great things like the ZRO tests.

The ZRO Memorial Technical Achievement Award Program was set up as a test of operating SKILL and equipment performance. It has nothing to do with who can shout the loudest. During a typical ZRO run, a control station will send numeric code groups using CW at 10 WPM. At the beginning of the run, uplink power from the control station will be set to match the general beacon downlink signal strength. This is level "zero". The control operator will send and repeat a random 5 digit number, then LOWER the uplink power by 3 dB (half power) and repeat the procedure with a new random number. This will continue to a level 27 dB below the beacon (level 9).

A participating listener monitors the downlink signal until he can no longer copy the numbers. Those who can hear the beacon at level zero qualify for a basic award. The challenge is to improve your station receive performance to the point where the lower level downlink signals (level 6-9) can be copied. To be fair to all these tests have to be carried out at times when squint angles are most favourable, ie. around apogee. Now that we can see some apogees we can look forward to once again taking part in these ZRO tests.

New Satellites on the horizon:

To whet your appetite over the coming year or so here is a list of goodies in the planning or testing stage. One of the major points brought out in the recent AMSAT-NA Space Symposium in Washington, DC was that there are 8 amateur radio satellites currently either under construction or will soon be launched. The following list gives the name of each satellite and their origin:

1) RS-15	AMSAT-UA
2) ARSENE	FRANCE
3) UMAMSAT-1	AMSAT-XE
4) ITSAT	AMSAT-IT
5) PHASE-3D	AMSAT
6) TECHSAT	ISRAEL
7) SUNSAT	AMSAT-SA
8) SEDSAT-1	University of Alabama Huntsville, AL

As many of the speakers at the Space Symposium mentioned, the next two-to-three years will be a very exciting time for OSCAR satellite users.

Arsene solar cell array:

A recent ESA (European Space Agency) publication serves to show how commercial satellite development can benefit from testing and research carried out on aboard amateur radio satellites. It seems that the solar cell arrays on board Arsene are of particular importance since Arsene will be the first satellite completely powered by European GaAs solar arrays.

To quote their description, The photovoltaic generator consists of six body mounted solar panels providing 43 W at End of Life (EOL) at 25.5 V with an active area of 0.8 square metres. It comprises 986 GaAs solar cells assembled in 29 strings of 34 cells connected in series. The "Beginning of life" output of the six panels is 182.6 W max at 25 degC. They go on to say that the experience gained with the Arsene program will continue with the realisation of more than 11 GaAs solar panels for three different satellites.

UO-11 telemetry display soft-ware:

I received a copy of TLM, a telemetry decode and display program from AMSAT-UK just before Christmas. For those interested in this area I'll review it next month. In the short look I have had so far, it seems to be quite comprehensive.

Phone BBSs beware:

Two separate incidents over the Christmas period serve to show just how careful you have to be when down loading software from phone (or packet) BBSs. The first was when a friend from the Astronomical Society expressed concern to me that he was having a lot of trouble updating the keps in Instantrak. It seems that every set of keps containing zeros (just about every set) would make the program lock up or go crazy.

He subsequently told me he had down loaded the program from a phone BBS. It obviously had a glitch or was someone's "customised" copy. I informed him that the program shouldn't have been there in the first place as it is owned by AMSAT, and that the best thing he could do was to scrub it and get a good copy from AMSAT-VK. He did and everything is now OK.

The second instance was when a friend had used a bit of basic source code from a program he had down loaded from a local phone BBS in another program. Yes, you guessed correctly, *it contained a virus which subsequently infected his whole system.* Just goes to show how careful you have to be.

Next month:

Soft-ware review of the TLM telemetry decode and display program from AMSAT-UK. 1 have had some inquiries so next month I'm going to attempt the impossible. I will try to give as complete a list as possible of ALL the frequencies used on ALL the currently operational amateur radio satellites.

Wish me luck and keep those cards and letters coming in folks.

ar

Help protect our frequencies — become an intruder watcher today

How's DX?

Stephen Pall VK2PS PO Box 93 DURAL NSW 2158

According to custom or hearsay news, some amateurs make "New Year Resolutions" at the end of December or at the beginning of January each year. The resolutions so made are supposed to benefit one personally, like listening for rare DX before starting transmitting; or to benefit other amateurs, like not tuning up on a frequency on which a QSO is already in progress.

Have you made any similar resolutions as an amateur or a DXer? Or have you decided not to make any, and continue in the same old way, thinking the world around you has not changed? This is now the time of year to take stock of ourselves and our attitude to the hobby we enjoy and which we are trying to keep for future generations. Good luck in your endeavour for a change.

Cambodia — XU

Due to the United Nations supervisory activity in Cambodia, a number of new stations can be heard on the bands.

Sanyi XU7VK (HA7VK) is still active on the DX window on 14MHz around 1130 UTC. He told me his licence is valid to the end of February, but he is already in the process of negotiating for a licence renewal for a future three months. At present he can operate only on 15, 20 and 40 metres. His QSL manager is HA0HW Szabo Laszlo, Box 24, 4151 Puspokladany, Hungary.

Eric XU0NU was heard on 21MHz SSB at around 0531. QSL goes to F6FNU. XU3Cross net, giving his QSL manager as VK3OT.

Somalia — T5

Another of the world's trouble spots, requiring United Nations intervention.

Chuck KA1PM was heard operating with the callsign T5CB on 14195, 14246, 21295 and 28455kHz. QSL goes to Chuck Brainard, PO Box 1311, Buena Vista, CO 81211-1311 USA.

It was also reported that Peter KH6HBZ will be active from Somalia in the near future. A number of amateurs on active service with the US Forces received permission to take their amateur equipment to Somalia. T5SDA was also heard operating from Mogadishu, giving his QSL information as N7IDI.

North Korea — P5

In the past few months there were quite a number of rumours circulating that the appearance of this rare DX country was imminent on the bands. Finnish, American, Japanese, Russian, Czech and even Hungarian groups were mentioned as possible operators.

Early December, a station signing P5IAA appeared on 15 metres, who gave the QSL address of a Hungarian station. At the end of November P5DTG was heard operating, and he gave his QSL info as OK1DTG.

P5RS7 was active from the middle of December on 21295kHz. This station was connected with Romeo 3W3RR. Romeo and two other operators were active until the end of December 1992. They were working with a licence issued by the military, which would explain the strange composition of the callsign. Romeo hopes his operation will be accredited by the DXCC desk of the ARRL. The QSL manager for this operation is JA1HGY.

"New" DX countries in Europe

Whilst the war in the former Yugoslavia destroys property and kills innocent people by the thousands, causing untold misery, the changed circumstances have now created "new" DX countries. The ARRL Awards committee declared the following former Yugoslav republics count as separate DX countries: Republic of Croatia 9A (formerly YU2) as from 26 June 1991; Republic of Slovenia S5 (formerly YU3) as from 26 June 1991; Republic of Bosnia-Hercegovina 4N4 (formerly YU4) as from 15 November 1991. Incidentally, the 9A QSL Bureau's address is HRS, Box 546, 41000 Zagreb, Croatia. The address of the S5 QSL Bureau is ZRS, Box 180, 61001 Ljubljana, Slovenia.

The former Czechoslovakia ceased to exist as from 1 January 1993. The country has split into two separate independent republics following a referendum. One is the Republic of Slovakia, with the capital Bratislava. The other is the Czech Republic, with the capital Prague. On 2 January, Rudi, the former OK3PC, was already on the bands with the new callsign OM3PC, for Slovakia.

Howland Island — KH1

Howland Island is located at 00 deg 48'N and 176 deg 38'W in the Pacific Ocean, and is uninhabited. It is under the control of the US Department of Interior, Fish and Wildlife Service as a national wildlife refuge. The island came into the news as early as 1937 when the well known US woman aviator Amelia Earhart, at the age of 40, vanished near the island in her attempt to fly around the world. To my knowledge, there were amateur activities from this island in 1948 and 1988. According to a news release dated 7 December 1992 issued by ON6TT, the activity will start on 26 January and should be in full swing when you read these notes. There will be 10 operators, all seasoned DXers and contesters. Six from the US, and one each from France, UK, the Netherlands and Belgium.

The activity is planned for a full seven days, and they intend to have 50,000 QSOs, with special attention to Europe.

Future DX activity

- According to various DX sources N6QHO/D2 will be active in Angola for the next two years.
- The Italian Antarctic station IA0PS is active until mid-February. QSL to home call I0JBL.
- 3W4VL and 3W4DK in Vietnam are now active. QSL to OK3IA.
- Lionel, VK6LA appeared on the 14MHz band on 8 December at 0951 UTC operating from Cocos (Keeling) Islands with the callsign VK9CB.
- VP8CLR is active from South Georgia for the next 12 months. QSL to PO Box 610, Swansea, Wales, UK.
- Kingman Reef KH5K and Palmyra Island KH5 will be activated by a group of amateurs, some of whom took part in the Clipperton FO0CI and South Sandwich VP8SSI operations. Pete N0AFW will lead a group of 12 operators departing Honolulu on 28 February. The trip to Palmyra will take five days. They will be on both islands simultaneously for just over a week.
- Vance W5IJU is planning a DXpedition to Navassa Island from 26 March to 3 April.
- The Desecheo KP5 operation was planned for 28 December to 4 January. QSL direct only to N0TG Randy Rowe, PO Box 891, Desoto, TX 75123-0891, USA.

Interesting QSOs and QSL Information

Note: callsign, name, frequency, mode, UTC, month.

9K2MU-14013-CW-2100-Nov. QSL to 9K2AR, MRA Maarafi, Box 97, Safat 13001, Kuwait.

FS/N3NCW-Joe-14222-SSB-Nov. QSL to home call, callbook address.

V73CT-Ken-10120-CW-Nov. QSL to Oklahoma DX Association.

V31DX-Bill-14209-SSB-Nov. QSL to KA6V.

D68GA-Don-14193-SSB-1527-Nov. QSL to N6ZV.

XX9AS-Alberto-14180-SSB-1540-Nov. QSL to KU9C.

ZA1M-Beri-14022-CW-0632-Nov. QSL to HB9BGN.

HZ1TA-14250-SSB-0549-Nov. QSL to OE6EEG.

A71AL/SP5EXA-10104-CW-2003-Nov. QSL to Box 22101, Doha, Qatar.

HS0AC-Ray-14322-SSB-Dec. QSL to Box 2008, Bangkok, Thailand.

FG5FC-John-14175-SSB-1210-Dec. QSL to F6DZU.

Note by VK2PS: Please let me know if you need full QSL addresses as in the past, or is the callsign adequate as above?

From here and there and everywhere

- ZL6JAM was a special event station from the 13th Scout National Jamboree attended by about 7500 scouts from many nations, among them 230 from VK. The station was active on all bands in many modes. All contacts will be automatically acknowledged by a special QSL card sent through the Bureau system.
- The DXCC desk of the ARRL announced on 1 December 1992 that QSOs conducted with Iranian amateurs after 20 August 1988 are acceptable for the DXCC Award.
- Eric WZ6C was heard operating with his new Bangladeshi callsign S21ZG. Nizam S21B is also active on 14183kHz at around 1200.
- If you worked Finnish stations with the suffix FIN they were the stations taking part in the Finland 75th Anniversary Contest on 6 December. A special QSL card is available to mark the event.
- The special event station VI150SYD celebrating the City of Sydney 150th anniversary ceased operation at 2359 UTC on 31 December 1992.
- The well known DX operator and contester, Al Slater G3FXB, died suddenly on 11 November 1992 whilst winding down his antenna tower.
- The Dominican Republic HI8 has changed its name to Dominicana.
- L4H was a special event station celebrating the anniversary of the Latin-American DX Net. QSL to PO Box 1401, Cordoba 5000, Argentina.
- Ever wondered if there is an international organisation which collects interesting QSL cards for preservation for "tomorrow"? OVSV, ADXB and Radio Austria International, the National Association of Austrian Radio Amateurs, the Association of the Austrian Short Wave Listeners and the Foreign Service of the Austrian Broadcasting Corporation are in charge of the QSL Collection. Their aim is to collect, keep archives and exhibit in public on a volunteer basis verifications of radio reception from all over the world. The QSL Collection is being supported by many national amateur societies, hundreds of individual operators and all the major DXpeditioners and their QSL managers. Their address is QSL Collection, c/- ADXB, PO Box 11, A-1111 Vienna, Austria.
- The former East German callsigns Y2 etc have disappeared from the bands. They have been allocated prefixes from the DL1-9 series.
- If you worked S92SS, he was Charles Lewis, ex-A22AA. QSL direct with SAE and one IRC to C Postal 522, Sao Tome, DRSTP, West Africa via Portugal.
- Romeo's Iran operation 9D0RR (5-17 Aug 1992) has been approved for the DXCC Award.
- Reading the Honour Roll Listings by the ARRL DXCC in the December 1992 issue of QST, I found the following interesting VK callsigns: Phone: VK5MS 323, VK4LC, VK5WO, VK6HD, VK6RU, all at 322, VK6LK 321, VK3DYL and VK5QW 317 and VK9NL 316. Mixed: VK5WO and VK6HD 322, VK9NS 320, VK3YL 319, VK3DYL and VK5QW 317. CW: VK9NS 317 (the only listing). As at 1 January 1993 there are 326 countries on the DXCC list. This will grow to a possible 327 when the DXCC includes the new Czech and Slovak republics and deletes the old Czechoslovakia entry.
- Lionel VK6LA, at present operating as VK9CB, advised Neil VK6NE that a straight-out airfare to Cocos (Keeling) Island costs $1250 return with the return date left open. The fixed go and return tourist rate is much lower. Accommodation on Cocos may be had for $150 a week. The island now has TV and BC stations, so when you go there leave your 1kW linear at home! Freight costs $9kg. The island is duty and sales tax free, and VK6NE would like to know in advance (he is the Federal QSL Manager for the VK9 and VK0 callsigns) if any amateurs intend to go there to operate from Cocos (Keeling) Island.
- Steve P29DX advised Neil VK6NE that in 1988 he operated as VK9YG and as AX9YG. He said he replied to cards sent for that activity to England to his old call G4JVG. However, he is unable to reply to a big batch of VK9YG QSL cards (total 1.25kg) at present still in the VK9 QSL Bureau, because he has no more VK9YG cards left for Bureau transmission.

Well known DX-ers Festus 9M8FH and Dave P29BT in the Hervey Bay Amateur Radio Club (Qld) meeting room.

Direct QSL cards received

S2/HA5BUS (7 mths — mgr) — 4U1UN (8 mths — mgr) — 8R1UN (6 mths) 4N2MP (5 mths — opr) — HS1HJJ (4 mnths — opr), CU30C (5 mnths — mgr), A35KB (7 wks — opr), 4Z4UR (4 wks — opr) — PJ1B (4 wks — mgr) — OG0M (2 mths — mgr).

Thank you

Thank you all who have assisted me in compiling these notes, especially to VK2LEE, VK3DD, VK4DA, VK4OH, VK5WO, VK6NE, VK8AV, OE3WHC, V73CT, and the following publications: QRZ DX, The DX Bulletin and the DX News Sheet.

Good DX and 73

ar

Contests

Peter Nesbit VK3APN — Federal Contest Coordinator
24 Sovereign Way Avondale Heights Vic 3034

Contest Calendar Feb-Apr 93

Rules are in the indicated issue.

Feb	13/14	PACC CW/SSB DX Contest	(Jan 93)
Feb	13/14	RSGB 160m CW Contest	(Jan 93)
Feb	13/14	Spanish RTTY Contest	(Jan 93)
Feb	20/21	ARRL DX CW Contest	(Feb 93)
Feb	26/28	CQ WW 160m SSB Contest	(Jan 93)
Feb	27/28	RSGB 7MHz CW Contest	(Feb 93)
Feb	27/28	UBA CW DX Contest	(Jan 93)
Mar	6/7	ARRL DX SSB Contest	(Feb 93)
Mar	13/14	BERU CW Contest	(Feb 93)
Mar	20/21	John Moyle Field Day	(Feb 93)
Mar	20/21	Bermuda Contest	
Mar	20/21	BARTG RTTY Contest	
Mar	27/28	CQ WPX SSB Contest	
Mar	27/28	RSGB 160m SSB Contest	(Jan 93)
Apr	1	Poisson d'Avril Contest	
Apr	4/5	SP DX Contest	
Apr	17/18	SARTG AMTOR Contest (Scandinavian)	
Apr	25/26	Swiss Helvetia Contest	

Since taking over this column 3 months ago, several readers have sent some very nice letters regarding the new extended contest coverage. Your letters and suggestions have been greatly appreciated, and I can assure you and everyone else of my commitment to present all necessary information to enable readers to confidently participate in contests relevant to VK. I know there are more VK "top guns" out there than activity over recent years would suggest; let's show the rest of the world that we are a force to be reckoned with! (For VK also read P29 — you are not forgotten!)

When forwarding logs, it is suggested that you pin or staple a self-addressed mailing label to your summary sheet to assist certificate processing. Especially for the larger contests, writing addresses on the envelopes/mailing tubes can be a quite sizeable task for the contest organisers.

Material for publication should be forwarded to the above address at least five weeks before the month of issue. Until next month, good contesting!

73 Peter VK3APN

1993 John Moyle Field Day Contest

0100 UTC Saturday to 0759 UTC Sunday, 20/21 March 1993.

by Phil Raynor VK1PJ

Well, once again those who enjoy a weekend in the bush should be planning for the JM Field Day. This year, as promised, there are no rule changes apart from a change to the scoring for 6m QSOs. The helpful hints received last year showed that there is nothing basically wrong with the rules. However I would suggest that operators not only read and familiarise themselves with these rules, but also read the comments printed with last year's results.

I hope to be on the air the weekend prior to the contest, family and work commitments permitting, to help anyone with rule interpretation etc. If you have any complaints, please submit them by phone or with your entry. My planned schedule is 14.275 MHz at 1200 EST and 3.570 MHz at 2030 EST (approx) Sunday 14 March. The 80m meeting will commence when the VK1 Division broadcast finishes. This is an experiment to try and improve the contest. For those who do not have HF callsigns I hope you can find a way of joining one of the nets, maybe as a second operator. If anyone would like to contact me privately, my home number is (06) 292 3260 and work (06) 280 5966. See you all on the air. I hope to be one of the operators of VK1DX (Canberra DX Group).

AIM

1. To encourage and provide familiarisation with portable operation, thus providing training for emergency situations. The rules are therefore designed to encourage field operation.
2. The contest is scheduled for the third weekend in March each year, and this year (1993) will run from 0100 UTC Saturday to 0759 UTC Sunday, 20-21 March.
3. Entries shall consist of one choice from each of the following (e.g. 6 hour, portable, single operator, phone, VHF/UHF):
   a. 24 or 6 hour;
   b. Portable, Home, or Receive;
   c. Single or Multiple operator;
   d. Phone, CW, or Open mode;
   e. HF, VHF/UHF, or All Band.

SCORING

4. Home stations for all sections shall score:
   a. 2 points per QSO with each portable station;
   b. 1 point per QSO with other home stations.
5. Portable HF stations shall score 2 points per QSO.
6. Portable stations shall score the following on 6m:
   a. 0-49 km, 2 points per QSO;
   b. 50-99 km, 10 points per QSO;
   c. 100-149 km, 20 points per QSO;
   d. 150-199 km, 30 points per QSO;
   e. 200-499 km, 50 points per QSO;
   f. ≥ 500 km, 2 (two) points per QSO.
7. Portable stations shall score the following on 144MHz and higher:
   a. 0-49 km, 2 points per QSO;
   b. 50-99 km, 10 points per QSO;
   c. 100-149 km, 20 points per QSO;
   d. 150-199 km, 30 points per QSO;
   e. ≥ 200 km, 50 points per QSO.
8. For each VHF/UHF QSO where more than 2 points is claimed, either the latitude and longitude of the station contacted or other satisfactory proof of distance must be supplied.

LOG SUBMISSION

9. Logs may be submitted either on paper or MS-DOS floppy disk. Disks may be 3-1/2 or 5-1/4 inches, 40 or 80 track. If on disk, ASCII text is preferred, although the following formats are acceptable: WordPerfect, Wordstar, Word 5, DBase, or Lotus 123.
10. Each log must be accompanied by a summary sheet (on paper) showing callsign, name, mailing address, section entered, number of contacts, claimed score, location of the station during the contest, equipment used, and for multi-operator stations, the callsigns and signatures of all operators. If any VHF/UHF QSOs have been made which qualify for more than 2 points, the station location must include latitude and longitude.
11. The summary sheet must include the following declaration signed by the operator, or in the case of a multi-operator station, one of the licensed station operators: "I hereby declare that this station was operated in accordance with the rules and spirit of the contest."
12. Logs must be postmarked no later than 30 April 1993, and forwarded to: John Moyle Contest Manager, PO Box 315, Fyshwick, ACT 2609, Australia.

AWARDS

13. At the discretion of the Contest Manager, certificates will be awarded to the winner of each portable section, including portable receiving. Note that entrants in a 24 hour section are ineligible for awards in the corresponding 6 hour section.
14. The outright winner will be awarded an individually inscribed wall plaque as permanent recognition. The Australian station with the highest CW score will be awarded the President's Cup, a perpetual trophy held at the Executive Office. Certificates for the winners of the various sections will be awarded at the discretion of the Contest Manager.

DISQUALIFICATION

15. General W1A contest disqualification criteria, as published in Amateur Radio from time to time, applies to entries in this contest. Logs which are illegible or excessively untidy are also liable to be disqualified.

DEFINITIONS

16. A portable station comprises field equipment operating from a power source independent of any permanent facilities, e.g. batteries, portable generator, solar power, wind power.
17. All equipment comprising a portable station must be located within an 800m diameter circle.
18. A single operator station is where one person performs all operating, logging, and spotting functions.
19. A single operator may only use a callsign of which he/she is the official holder. A single operator may not use a callsign belonging to any group, club or organisation for which he/she is a sponsor except as part of a multi-operator entry.
20. A multi-operator station is where more than one person operates, checks for duplicates, keeps the log, performs spotting, etc.
21. A multi-operator station may use only one callsign during the contest.
22. Multi-operator stations may use only one transmitter on a given band at any one time, regardless of the mode in use.
23. Multi-operator stations must submit a separate log for each band.
24. A club, group, or organisation will be considered a multi-operator station by default.
25. None of the portable field equipment may be erected on the site earlier than 24 hours before the beginning of the contest.
26. Single operator stations may receive moderate assistance prior to and during the contest, except for operating, logging and spotting. The practice of clubs or groups providing massive logistic support to a single operator is, however, totally against the spirit of the contest. Offenders will be disqualified, and at the discretion of the manager, may be banned from further participation in the contest for a period of up to 3 years.
27. Phone includes SSB, AM and FM.
28. CW includes CW and RTTY.
29. It is not expected that other digital modes will be used in the contest, but if they are, they shall be classed as CW.
30. All amateur bands may be used except 10, 18 and 24MHz. VHF/UHF includes all amateur bands above UHF.
31. Cross-mode contacts are not permitted for contest credit.
32. Cross-band contacts are not permitted for contest credit.
33. Contacts made via repeater systems are not permitted for contest credit. However, repeaters may be used to arrange a contact on another frequency where a repeater is not used for the contact.
34. Portable stations may make repeat contacts and claim the appropriate points providing that at least three hours have elapsed since the previous valid contact with that station on the same band and mode.
35. Home stations may not claim points for repeat contacts.
36. Stations must exchange ciphers comprising RS/RST plus a 3 digit number commencing at 001 and incrementing by one for each contact.
37. Portable stations shall add the letter "P" to their own cipher, e.g. 59001P for the first contact.
38. Multioperator stations shall commence operation on each band with 001.
39. Receiving stations must record the ciphers sent by both stations being logged. QSO points will be on the same basis as for Home Stations, unless the receiving station is portable.
40. The practice of commencing operation and later selecting the most profitable operational period within the allocated contest times is not in the spirit of the contest, and shall result in disqualification. The period of operation commences with the first contact on any band or mode, and finishes either 6 or 24 hours later.

73
Phil

ARRL DX Contest (CW & SSB)

The object of this contest is to work as many W/VE amateurs as possible on 1.8-30 MHz, excluding 10, 18 and 24 MHz. The CW section is on the third full weekend in February (20-21 Feb 1993), and phone on the first full weekend in March (6-7 Mar 1993). The contest runs from 0000z Saturday to 2400z Sunday.

Single operator categories include single band, all band, all band QRP ($\geq$ 5W output), and all band assisted. In these categories, the operator performs all operating and logging functions. If assistance is received from spotting nets or other alerting systems not physically located at the station, the operator must enter the all band assisted category.

Multi-operator stations are where more than one person operates, checks for duplicates, keeps the log, etc. Categories include single transmitter (max 1 transmitted signal at any one time), two transmitter (max 2 transmitted signals), and unlimited (max 1 signal per band). In the single and 2 transmitter categories, once a transmitter has begun operation on a band, it must remain on that band for at least 10 minutes. Listening time counts as operating time.

Exchange RS(T) and a 3 digit number indicating approx output power. W/VE stations will send RS(T) and state/province.

Score 3 points per W/VE QSO. The multiplier is the sum of US states and District of Columbia (DC) (except KH6/KL7), NB (VE1), NS (VE1), PEI (VE1 or VY2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), YUK (VY1), NF (VO1), and LAB (VO2) worked to a maximum of 62 per band. The final score equals the total QSO points times the multiplier.

Miscellaneous rules include the stipulation that for contest credit, an operator may not use more than one call sign from a given location; crossmode contacts are not allowed; the use of non-amateur radio means of soliciting contacts (eg telephone) is precluded; and all transmitters and receivers must be located within a 500m diameter circle, excluding directly connected antennas (this precludes the use of remote receiving facilities, excepting spotting nets used for multiplier hunting as allowed for the single operator assisted and multi-operator categories).

Logs must indicate times in UTC, bands, call signs, complete exchanges sent and received, and QSO points. Multipliers must be clearly marked the first time they are worked. Duplicate contacts must not be claimed for credit, as the entry may be disqualified if duplicates contribute more than 2% to the overall score. Entries with more than 500 QSOs must include crosscheck (dupe) sheets. Logs may optionally be submitted on MS-DOS disks, 3-1/2 or 5-1/4 inch 40 or 80 track, in an ASCII file using the ARRL Standard File Format. Attach a summary sheet with call, name, address, category, score, etc. Multi-operator entries must list all operators. Include a signed declaration that all radio regulations and contest rules were observed.

Entries must be postmarked by 7 April 1993 or will be classed as checklogs (no exceptions)! Mark the envelope CW or phone and send the log to ARRL Contest Branch, 225 Main Street, Newington, CT 06111, USA.

Certificates will be awarded to the top scoring stations in each country and category, and plaques to the top worldwide and continental stations.

RSGB 7MHz CW Contest

This contest has the object of contacting as many British Isles stations as possible on 40m CW, and this year it runs from 1500z Saturday 27 Feb to 0900z Sunday 28 Feb 1993.

Frequencies are 7.000-7.030 MHz. Exchange RST plus serial number starting at 001. UK stations will add their county code. Oceania stations score 30 points per QSO, and the final score is the total QSO points times the number of UK counties worked.

Include a summary sheet showing all standard details, plus a checklist if more than 80 QSOs are made. Logs must arrive by 19 April 1993 at the address given for the Commonwealth Contest (see below). Certificates will be awarded to the leading entrants in each overseas section.

RSGB Commonwealth Contest (BERU) 1993

This contest is to promote contacts between stations in the British Commonwealth and Mandated Territories, and runs each year on the second full weekend in March (this year from 1200z Saturday 13 March to 1200z Sunday 14 March 1993).

Categories are single operator only, single and multiband. Operators may not receive any assistance whatsoever, such as the use of spotting nets, packet clusters, etc.

Contacts may be made with any station using a British Commonwealth prefix, except those within the entrant's own call area. Allowable bands are 80, 40, 20, 15 and 10m, CW only. Entrants should use the bottom 30kHz of each band, except when contacting novice stations above 21030 and 28030kHz.

Exchange RST and serial number commencing with 001. Score 5 points per QSO, with a bonus of 20 points for each of the first 3 QSOs with each Commonwealth call area, on each band (note that for the purpose of this contest, the entire UK area counts as *one* call area).

A number of "headquarters" stations will be active during the contest and will send "HQ" after their serial number to identify themselves. Every HQ station counts as an additional call area, and therefore attracts the 20 point bonus. Entrants may contact their own HQ station for points and bonuses.

Duplicate contacts must be clearly marked and not claimed for points. Each unmarked duplicate contact found for which points have been claimed will result in the deduction of 55 points. Entries containing more than five such duplicates will be liable to disqualification.

Entrants making more than 80 QSOs should include a checklist of the callsigns appearing in the log, sorted into alphabetical order and with either the serial number sent or the time of contact beside the callsign.

Each entry must include a cover sheet containing call, name, address, scores claimed on each band, equipment details, signed declaration, any comments, etc. Send the log to arrive before 18 April 1993 to: RSGB HF Contests Committee, c/o S. V. Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR& 7AF, England. Airmail is recommended, as late logs may be treated as check logs.

Awards include the Senior and Junior Rose Bowls, and Certificates of Merit, to the leading stations in the various categories and call areas.

The following call areas are recognised for the purpose of scoring in the 1993 Commonwealth Contest:

A2, A3, AP, C2, C5, C6.

G, GB, GD, GI, GJ, GM, GU, GW (all one area).

H4, J3, J6, J7, J8.

P2, S2, S7, T2, T30, T31, T32, T33.

V2, V3, V4, V5, V8.

VE1, CY0 (Sable), CY0 (St Paul), VE2, VE3, VE4, VE5, VE6, VE7, VE8. VY1 (Yukon).

VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9C, VK9L, VK9M, VK9N, VK9W, VK9X.

VK0 (Heard), VK0 (Macquarie), VK0 (Antarctica).

VO1, VO2.

VP2E, VP2M, VP2V, VP5, VP8 (Falklands), VP8 (S Georgia), VP8 (S Sandwich), VP8 (S Shetland), VP8 (Antarctica), VP9, VQ9, VR6, VS6/VR2.

VU, VU4 (Andaman), VU7 (Laccadive).

YJ, Z2, ZB2, ZC4, ZD7, ZD8, ZD9, ZF, ZK1(N), ZK1(S), ZK2, ZK3, ZL0, ZL1, ZL2, ZL3, ZL4, ZL5, ZL7, ZL8, ZL9.

3B6/7, 3B8, 3B9, 3DA.

4S, 5B4, 5H, 5N, 5W, 5X, 5Z.

6Y, 7P, 7Q, 8P, 8Q, 8R.

9G, 9H, 9J, 9L.

9M2, 9M6/9M8, 9V, 9Y.

GB5CC RSGB HQ station, VK3WIA WIA HQ.

All calls operated from Commonwealth controlled of the Antartic, VK0, VP8, ZL5 count as one call area.

Results of 1991 CQWW DX SSB Contest

(Shown in order: call, band, score, QSOs, zones, countries. Asterisk = low power category ≥ 100W; A = all band; bold = certificate winner)

Single Operator:

VK2BEX	A	2,146,658	2288	112	211
VK5GN*	"	430,650	762	76	123
VK3PU*	"	397,824	563	88	168
VK2CCK*	"	283,383	565	67	116
VK6JIP	"	184,870	471	51	88
VK3ALZ	"	99,261	324	42	81
VK8SD	"	83,054	235	48	84
VK5FOX	"	36,210	170	17	28
VK2KS	28	487,015	1406	32	87
VK2ARJ*	"	317,499	1190	30	61
VK3TZ	"	145,782	649	27	78
VK4NAD*	"	135,801	577	26	54
VK8BE*	"	1,938	34	10	9
VK4DMP	21	48,025	203	29	56
VK3SM*	14	29,337	134	25	52

Multi Operator Single Transmitter:

VK1DX	2,434,244	2879	91	202
VK6OD	862,068	1479	70	129

VK2BEX was Zone 30 Leader.

Results of 1991 Scandinavian Activity Contest

(Shown in order: call, section, score, QSOs, QSO points, multiplier.)

Single Operator All Band:

VK2APK	CW	30,176	286	328	92
VK2APK	SSB	10,846	155	187	58
ZL1AAS	SSB	7,353	125	129	57
P29DX	SSB	1,470	40	42	35

All the above were certificate winners, and VK2APK won the plaque for Oceania in both the CW and SSB sections of the contest.

The next SAC contest is in September, and rules will be published in AR.

ar

ALARA

Robyn Gladwin VK3ENX Box 438 Chelsea 3196
VK3ENX@VK3YZW

Results of the twelfth ALARA Contest, November, 1992.

1	VK4DLS	Lyn	748	Top score overall, top phone, top VK4 non-member, top VK YL trophy
2	VK5NYD	Nora	616	Top VK ALARA member, top VK Novice, top VK5 ALARA member
3	V85BJ	Barbara	418	Top DX YL trophy, top Pacific Is ALARA member
4	VK4RL	Robyn	329	Top VK4 ALARA member
5	VK3NYL	Judy	324	Top VK3 ALARA member
6	VK3KS	Mavis	265	
7	ZL1AMN	Dave	259	Top ZL OM
8	VK5BMT	Maria	256	
9	ZL1BRX	Eileen	249	Top ZL non-member
10	VK3DYL	Gwen	239	
11	VK5CTY	Christine	234	
12	VK4BJJ	Julie	228	
13	VK4PT	Pat	207	
14	ZL1ALK	Celia	205	Top ZL ALARA member
15	VK2DDB	Dorothy	179	Top VK2 ALARA member
16	VK8AV	Alan	178	Top VK OM
17	VK3XB	Ivor	175	
18	VK4VR	Val	169	
19	ZL1BIZ	Elva	168	
20	VK4AOE	Margaret	167	
21	VK5AYD	David	165	
22	VK4ICU	Clayton	162	
23	VK3DVT	Valda	150	
24	VK3OZ	Pat	148	
25	VK3AEB	Erika	140	
26	VK7HD	Helene	129	Top VK7 ALARA member
27	ZL1WA	Alma	128	
28	VK3DYF	Bron	95	
29	ZL2AGX	Dawn	95	
30	VK6NKU	Peggy	80	Top VK6 ALARA member
31	VK6DE	Bev	58	
32	VK5AOV	Meg	56	
33	VK4MDG	Sally	55	
34	L40018	Charles	49	Top VK SWL
35	VK4KRR	Ted	44	
36	VK5ANW	Jenny	43	
37	VK3DXH	Lindsay	43	
38	VK7RY	Edgar	35	
39	JA8GTA	Yohko	28	Top Japan YL non-member
40	VK3ALD	Len	19	

41	VK4DRL	District Radio Ladies" Club station 308	
42	VK3ER	EMDRC Club station	43
43	VK4WIC	Dalby Radio Club station	39
44	VK3DMS	Marilyn Check log	

21	VK	ALARA members
5	DX	ALARA members
3	VK	non-member YLs
2	DX	YL non-members
8	VK	OMs
1	DX	OM
1	SWL	
3	Club stations	44 logs in total

The hopes of everyone from last year for better conditions DID come true, though the QRM on 80 metres during the evening was pretty rough. I must thank everyone for having the logs in early. It does make life easier! Numbers are up again for this year, in fact the best since I became Contest Manager, which, of course, is directly attributable to the better conditions .

It is a pity that no-one has taken out the Florence McKenzie trophy this year. One person did have a go but did not hear any CW YLs.

Perhaps someone will take up the challenge next contest.

Congratulations go to the overall winner, Lyn, VK4DLS, and the top ALARA member, Nora, VK5NYD. It was great to see more OMs than ever.

We had an experimental section this year for Club stations, unfortunately not widely publicised as the decision was taken very late. While they were not able to qualify for a certificate this year, the Committee will be looking at how to include such stations in future contests. Three Club stations sent in logs, and at least one other was heard on the day. This interest bodes well for the future of the Contest.

Everyone seems to have enjoyed this year's Contest very much — I know I did. So let's hope for bigger and better things next November 13th, especially on CW!

33 and 73
Marilyn Syme VK3DMS
Contest Manager

Silent Key

It is with regret that ALARA notes the passing of their esteemed DX member, Ruth Lobb, ZL3PL.

Congratulations

Confirmation has been received that ALARA DX member, Aola Johnston, ZL1ALE, is the first ZL YL to gain a place on the ARRL Honor Roll.

33
ar

YOUR ANTENNA SUPERMARKET

We carry a wide range of antennas and accessories. Here are just a few...

HUSTLER RX-2 2m 5/8 WAVE MOBILE

Here's value! A quality American 2m 5/8 wave magnetic mount antenna for mobile or temporary base station use. Comes complete with 4.5m of coax cable with a PL259 attached. It provides 3dB gain with a power rating of 100W maximum, and uses a flexible stainless steel whip to minimise wind loading.
Cat D-4805

$49.95

HUSTLER 1/4 WAVE MAGNETIC ANTENNA

HUSTLER

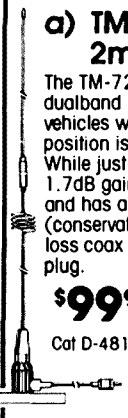
A great idea for extending the range of handheld transceivers! The Hustler UGM is a compact 1/4 wave magnetic mount mobile antenna supplied with 2.1m of mini coax fitted with a BNC plug. Simply use the supplied frequency chart to cut the flexible stainless steel whip to the required length for your application (within the 140-500MHz range) and it's ready to use.
Cat D-4802

$39.95

DUALBAND MOBILE ANTENNAS

Our exclusive range of Brainer 2m/70cm antennas provide excellent performance at a reasonable price. They feature quality Japanese construction and come complete with detailed, locally written instruction sheets so you can get the best from your mobile station.

a) TM-723m MAGNETIC 2m/70cm ANTENNA



The TM-723m is a compact, slimline dualband mobile antenna ideally suited to vehicles where a permanent mounting position is not available (eg. a company car). While just 0.7m long, the TM-723m provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a maximum power rating of 50W (conservative). Supplied complete with low loss coax cable fitted with a moulded PL-259 plug.

$99.95 *New for '93*

Cat D-4812

BRAINER

b) ST-7500 2m/70cm ANTENNA

The ST-7500 is a compact, medium gain dualband antenna that provides good performance when gutter or roof mounted. It's just 1m long, provides 3dB gain on 2m and 5.5dB gain on 70cm and has a maximum power rating of 150W. A quality tapered stainless steel whip element and an inbuilt tilt-over mechanism make the ST-7500 ideal for use on vehicles that often have to enter garages or carparks. Requires an SO-239 antenna base (D-4035 or D-4052 recommended), or SO-239 magnetic mount (D-4520).

BRAINER

$79.95

Cat D-4810

c) ST-7800 DELUXE 2m/70cm ANTENNA

Our best dualband mobile antenna! The ST-7800 is ideal for long range mobile operation, providing high gain (4.5dB on 2m, 7.2dB on 70cm) from its 1.5m length. Like the ST-7500, it incorporates an inbuilt tilt-over mechanism to allow laying the antenna over when entering carparks, and it can either be gutter or roof-mounted with good results. With its high gain and 150W power rating the ST-7800 can also be used successfully as a temporary base station antenna. Requires an SO-239 antenna base (D-4035 or D-4052 recommended).

BRAINER

Cat D-4815 **$129.95**

New for '93

REVEX SWR/ PWR METERS

Revex meters feature quality Japanese construction, large meter movements and low-loss widebond SWR/PWR sensors. We carry 2 of their popular models, the W502 and the W540, each of which provide 3 power reading scales plus SWR measurement, but with differing frequency coverage.

W502 HF/6M METER

Covers 1.8 - 60MHz and has an accurate P.E.P metering circuit. As well, it has 20W, 200W and 2kW scales and a backlit meter. Requires 13.8V DC.
Cat D-1360

$239

W540 VHF/UHF METER

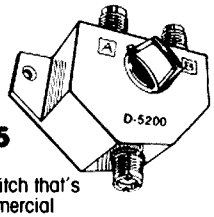
Covers 140 - 525MHz and has an average-reading metering circuit. It has 4W, 20W and 200W scales. Requires no DC power.
Cat D-1370

$199

Great Price!

2 POSITION COAX SWITCH

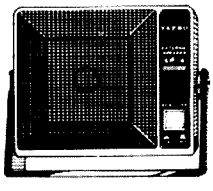
Cat D-5200 **$39.95**



A heavy duty, 2 way coax switch that's suitable for Amateur, or commercial applications. It's well constructed with a die-cast case and can handle up to 2kw PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.

YAESU SP-4 EXTENSION SPEAKER

$39.95

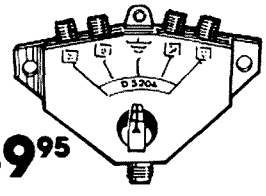


This quality speaker has a built-in switchable noise filter and comes with a swing mounting bracket. It handles 3W at 8 ohms and looks smart alongside any RF rig. Comes complete with lead and 3.5mm mono plug.
Cat D-2300

New for '93

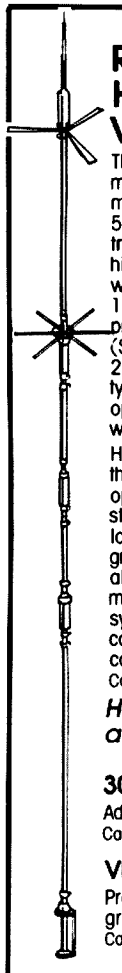
With Surge Protection

4-WAY COAX SWITCH



$89.95

A high quality 4-way coax switch featuring rugged die-cast aluminium construction, 2kW P.E.P. (max.) power handling at 30MHz, and only 0.3dB insertion loss. It has an in-built surge suppressor and automatic grounding of all un-used connections..... in conjunction with a *'ground'* position on the switch, it helps protect against lightning induced surge damage.
Cat D-5204



RUGGED HUSTLER HF 5-BAND TRAP VERTICAL ANTENNA

The tradition continues! The 5BTV is yet another masterpiece from the people who have been making antennas for over 33 years. This rugged 5 band HF trap vertical uses Hustler's exclusive trap design (25mm solid fibreglass formers, high-tolerance trap covers and low loss windings), for accurate trap resonance with 1kw(PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, less than 2:1 SWR at band edges), with 80kHz bandwidth typical on 80m at less then 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands.

High strength aluminium tubing and a 4mm (wall thickness) extra heavy-duty base section provides optimum mechanical stability. What's more, stainless steel clamps and hardware guarantee a longer life. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs the 5BTV can be fed with any length of 50 ohm coax cable.

Cat D-4920

Hurry, last chance at the old price!

$299

Made in USA

30m RESONATOR KIT

Adds 30m coverage and includes all hardware.

Cat D-4921

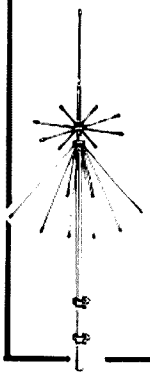
$89.95

VRK-1 RADIAL KIT

Provides a 5-band ground-plane for above ground antenna mounting positions.

Cat D-4922

$69.95



DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz and is easy to assemble and install. With extensive aluminium and stainless steel construction it's extremely durable, while allowing transmission on the 6m, 2m, 70cm and 23cm bands with a maximum power rating of 200W PEP. Complete with mast mounting hardware, stainless steel U-bolts and instructions.

Cat D-4840

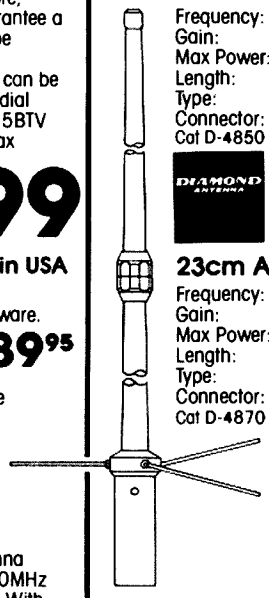
$169

VHF/UHF BASE STATION ANTENNAS

We carry a wide selection of high quality vertically polarised base station antennas to suit most VHF/UHF Amateur applications. Each antenna was chosen based on its tested performance, reliability, construction quality and value for money, so you can be confident they'll work well the first time and last for years. Brands supported include Diamond and Brainer from Japan, as well as an excellent Australian made Mobile One product.

a) HIGH PERFORMANCE VHF/UHF BASE STATION ANTENNAS

These antennas from Diamond and Brainer are all of a stacked colinear type which provide high gain, wide bandwidth and a low radiation angle for extended range base station operation. Each antenna uses a jointed F.R.P (fibreglass reinforced polyester) outer tubing radome with gasket seals to ensure excellent all weather operation, and is supplied with compact ground-plane radials for a clean radiation pattern. Corrosion resistant stainless steel mounting hardware is also supplied. Brainer antennas are exclusive to Dick Smith Electronics and feature detailed locally written instruction sheets. Both brands are covered by a 1 year warranty.



2m ANTENNA F-23A

Frequency: 144-148MHz
Gain: 7.8dB
Max Power: 200W
Length: 4.53m
Type: 3 x 5/8 λ colinear
Connector: SO-239
Cat D-4850

DIAMOND ANTENNA

$239

2m/70cm ANTENNA GST-1

Frequency: 144-148MHz, 430-440MHz
Gain: 6.0dB(2m), 8.0dB (70cm)
Max Pwr: 200W
Length: 2.6m
Type: 2 x 5/8 λ colinear (2m), 4 x 5/8 λ colinear (70cm)

Cat D-4830

BRAINER

$199

23cm ANTENNA F-1230A

Frequency: 1260-1300MHz
Gain: 13.5dBi
Max Power: 100W
Length: 3.06m
Type: 25 x 1/2 λ colinear
Connector: N-type
Cat D-4870

$299

2m/70cm ANTENNA GST-3

Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB (2m), 11.7dB (70cm)
Max Power: 200W
Length: 4.4m
Type: 3 x 5/8 λ colinear (2m), 7 x 5/8 λ colinear (70cm)
Connector: SO-239
Cat D-4835

BRAINER

$279

b) ECONOMY 2m BASE STATION ANTENNA

An outstanding value-for-money, compact 1/2 wave Australian-made 2m base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection.

Cat D-4820

5 Year Warranty

$49.95

MOBILE ONE

DS XPRESS PHONE & MAILORDER SERVICE
Outside Sydney (FREE Call) 008 22 8610 Sydney And Enquiries - (02) 888 2105
FAX: (02) 805 1986 or write to DS XPRESS, PO BOX 321 N/RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.

DICK SMITH ELECTRONICS

STORE LOCATIONS:
NSW • Albury **21 9696** • Bankstown Square **707 4866** • New Store Location - Blacktown Shop 301, 22-24 Patrick St **671 7722** • Brookvale **905 0441** • Bondi **387 1444** • Campbelltown **27 2196** • Chatswood Chase **411 1955** • Chullora **642 8922** • Gore Hill **439 5311** • Gosford **25 0235** • Hornsby **477 6633** • Hurstville **500 0022** • Kotara **56 2002** • Liverpool **000 9696** • Maitland **33 7096** • Miranda **525 2722** • Newcastle **61 1896** • North Ryde **078 3855** • North Sydney (Greenwood Plaza) **964 9407** • Orange **010 400** • Parramatta **689 2100** • Penrith **32 3400** • Railway Square **211 3777** • Sydney City **267 9111** • Tamworth **66 1711** • Wollongong **28 3800 ACT** • Belconnen **(06) 253 1705** • Fyshwick **290 4944 VIC** • Ballarat **31 5433** • Bendigo **43 0388** • Box Hill **890 0899** • Coburg **383 4455** • Dandenong **794 9377** • East Brighton **592 2366** • Essendon **379 7444** • Footscray **689 2066** • Frankston **783 9144** • Geelong **232 711** • Melbourne City **399** Elizabeth St **328 6088** & **248** Bourke St **639 0366** • Richmond **428 1614** • Ringwood **879 5336** • Springvale **547 0622 QLD** • Booval **282 6200** • Brisbane City **229 9377** • Buranda **391 6266** • Cairns **311 515** • Capalaba **245 2870** • Chermside **359 6255** • Maroochydore **791 600** • Rockhampton **27 9644** • Southport **32 9033** • Toowoomba **36 4300** • Townsville **72 5722** • Underwood **341 0644** • **SA** • Adelaide City **232 1200** • Beverley **347 1900** • Elizabeth **255 6099** • Enfield **260 6066** • St. Marys **277 9977 WA** • Cannington **451 6666** • Fremantle **336 6733** • Perth City **481 3261** • Midland **250 1400** • Northbridge **328 6944 TAS** • Hobart **31 0600** • Launceston **344 555 NT** • Stuart Park **81 1977 STORES ACROSS AUSTRALIA AND NEW ZEALAND**

B 1440

QSLs from the WIA Collection

Ken Matchett VK3TL Hon Curator WIA QSL Collection
4 Sunrise Hill Road, Montrose, Vic 3765 Ph: (03) 728 5350

Navy — the Senior Service — Part 1

Particularly for the past 40 or so years, several radio amateurs have been displaying their other interests on their QSL cards. So common has this practice become, especially in recent times, that the WIA collection has developed a fine thematic card collection. One's interest in the armed services and merchant navies can be seen in the QSL cards of many nations.

GB5RN

The Royal Navy Amateur Radio Society (RNARS) had its origins in England in 1960 with the purpose of gathering together all radio amateurs who had any connection with the Navy or its allied services. The GB5RN card is a special event QSL showing the flagship of the RNARS, the HMS Belfast, moored on the River Thames between Tower Bridge and London Bridge. The special QSL commemorated 50 years of HMS Belfast, launched in 1938 by Mrs Chamberlain, wife of the then Prime Minister. The ship had a distinguished history serving in the North Atlantic and on Russian convoys, later taking part in the Korean War. Finally she was opened to the public as a maritime museum on Trafalgar Day 1971. The RNARS has been associated with the ship since 1973, when interested RNARS members set upon the task of restoring the ship's wireless room.

G4HMS

As well as GB5RN, the collection also holds a number of especially allotted QSLs associated with the RNARS. These include G4HMS and GB2RN, the two permanent station calls of the HMS Belfast; GB3RN, the HQ station of the RNARS; and GB4RN, which station celebrated the 21st anniversary of the Society. The HQ station is located on HMS Mercury at Petersfield, England. Three other special QSLs are GB0BRN, located at Huddersfield, which station celebrated the Silver Jubilee 1960-1985 of the RNARS. The card GB75MN was a special issue QSL commemorating the role of the Merchant Navy, and GB50RC a special card celebrating the 50th anniversary of Russian convoys. The first Russian convoy ship, "Dervish", left Scapa Flow on 21 August 1941 and, until the war's end, considerable losses were experienced, including 21 allied warships and 100 merchant ships lost.

The membership of the RNARS has been extended, being open to Merchant and Reserve Navy personnel, civilians employed by Commonwealth Navies, Royal Marines as well as to Sea Cadets and women of the WRNS. In recent years, membership has been extended to Navy personnel of former enemy countries, all with the common bond of having served at sea. There are over 3000 members of the RNARS worldwide. Every member of the RNARS is allocated a membership number which is proudly displayed on their QSL card. Most DXers would have received amongst their QSLs several such cards, many of which attractively depict one of the ships of the Royal Navy. A little less common are the QSLs of members of the Submarine Amateur Radio Club, which is affiliated with the RNARS.

VK3RAN

The Royal Australian Navy was born on 1 March 1901, when the ships and personnel of the separate States' navies were placed under the control of the Federal Government formed only two months before. It was in July 1911 that King George V approved the designation "Royal Australian Navy". At the same time it was decreed that all Australian naval vessels were to be prefixed with the words "His Majesty's Australian Ship (HMAS)". In December 1978 the isolated members of the RNARS who had taken up residence in Australia got together and resolved to form an Australian branch of the Society. This was established in October 1979. A radio net was arranged and interest grew, especially when it was made known that membership was open to serving and former RAN and Australian Merchant Navy personnel as well as to former RN members. Membership in Australia now exceeds 150.

Just as RNARS members had restored the bridge wireless office on board HMS Belfast, members of the Australian branch of the RNARS in February 1980 accepted the challenge of carrying out a similar project on board the HMAS Castlemaine, which had been handed over by the Australian Navy in 1974 to the Maritime Trust of Australia. Originally allocated the station call VK3BZU, the special call VK3RAN was later granted by the Minister of Posts and Telecommunications. The VK3RAN QSL shows the HMAS Castlemaine which has become the flagship of the Australian branch of the RNARS. The ship is presently moored at Gem Pier, Williamstown, Victoria.

A fuller account of the establishment of the Australian branch of the RNARS (recently evolved as "RNARS Australia") and the story of station VK3RAN is to be found in the article entitled "The Royal Navy Amateur Radio Society, Past, Present, Future" by the then Australian branch manager, Terry Clarke VK2ALG in the December 1980 edition of AR. The author would like to acknowledge the information on the RAN and the RNARS forwarded to him by the Department of Defence and VK2ALG respectively. Interested readers should be aware of the daily "Navy Net" on 7090kHz at 1400 local time. Information can be obtained by writing to the Secretary, RNARS Australia, 1 Burnbank Grove, Athelstone Park, SA 5076, or to the follow-

ing committee members: VK1DD, VK2ALG, VK2CWS, VK3QU, VK4CY, VK5ADE and VK6UA — all QTHR.

— to be continued

Author's note

As an interested reader of this series of articles on the story behind QSL cards, would you like to add your name to the hundreds of other amateurs who have contributed cards to the collection? All donations are acknowledged personally as well as being recorded in this column. Please contact the author who is also the honorary curator of the collection. Arrangements can be made for the delivery of sizeable donations. Please help in this worthwhile project.

Thanks

The W1A (Vic Div) would like to express its thanks to the following for their generous donations of QSL cards: (supplementary list)

Peter VK3CFA
Frank VK2QL
Mike VK6HD
Terry VK2ALG
Ossie VK3AHK
Brian VK2MQ
Jim VK9NS (Norfolk Is)

Also to the family and friends of the following "Silent Keys" (supplementary list)

Bill Wallace VK4KHZ (courtesy of Joan VK4BJE)
Lin Rhodes VK2IB (courtesy of Rolly VK2GFO)

ar

Repeater Link

Will McGhie, VK6UU Waterloo Cr Lesmurdie 6076 VK6UU @ VK6BBS

Among the many problems that occur at a remote repeater site, solar or wind powered sites have the highest potential for failure. If the supply of electrical energy fails, or is inadequate, then eventually the on site battery goes flat. How your repeater handles this situation can be embarrassing.

The repeater receiver may fail with the mute open due to low battery voltage. This then turns the repeater transmitter on until the repeater control circuit times out. What if the control circuit fails as well, or the transmitter develops a problem ? The low voltage condition is one that should be part of your testing procedure.

Even if your repeater handles the on site batteries going flat, leaving the batteries connected to the repeater continues to discharge them even further. If the problem is not sorted out quickly many batteries can be destroyed.

The solution is to install a low voltage sensor that disconnects the load from the battery. However if the problem on site is a lack of sun or wind, then once the batteries have received a charge the sensor should apply power to the repeater again.

The circuit shown does this. The NE 555 is used as a sensor to detect a low voltage condition and disconnect the load. Once the battery voltage rises to a charged condition, the load is re-connected. Of course if the battery is not re-charged due to a fault with the power source, then the load remains isolated.

The off and on level is set by VR1 and VR2. Setting up these pots can be confusing, so I have included voltage levels to set pins 2 and 6 to. With the voltages shown, the sensor switches off at 11 volts and on at 13 volts. Set these voltages with a supply voltage of 12.5 volts, as they vary with supply voltage.

The 2 μF capacitor is needed to force the circuit, on applying power to it, to turn on in the load connected mode. Without this capacitor, the sensor comes on in the load off mode, if the battery voltage is below 13 volts.

However the real strong point of this design is the current switching capacity. With the single 2SJ174 power MOSFET shown, up to a 20 amp load can be isolated. That's right 20 amps. The P channel power MOSFET has an on resistance of 0.07 ohms! This means that for a 1 amp load the voltage drop would be 0.07 of a volt. For a typical repeater system of say 5 amps, this means 0.35 of a volt drop. If this volt drop is too high then you can parallel as many 2SJ174's as you like. Four of these power MOSFET's in parallel would have an on resistance of 0.0175 of an ohm. Paralleling means just that, gate to gate, drain to drain, and source to source.

A mechanical relay would be a liability in such a design as it must draw current with the load connected. At remote sites every mA adds up. With a 5 amp load very little heat sinking is needed, as the power MOSFET is only dissipating 1.75 watts. I found 5 cm by 2 cm was enough. With two power MOSFET's in parallel, no heat sinking for a 5 amp load would be required.

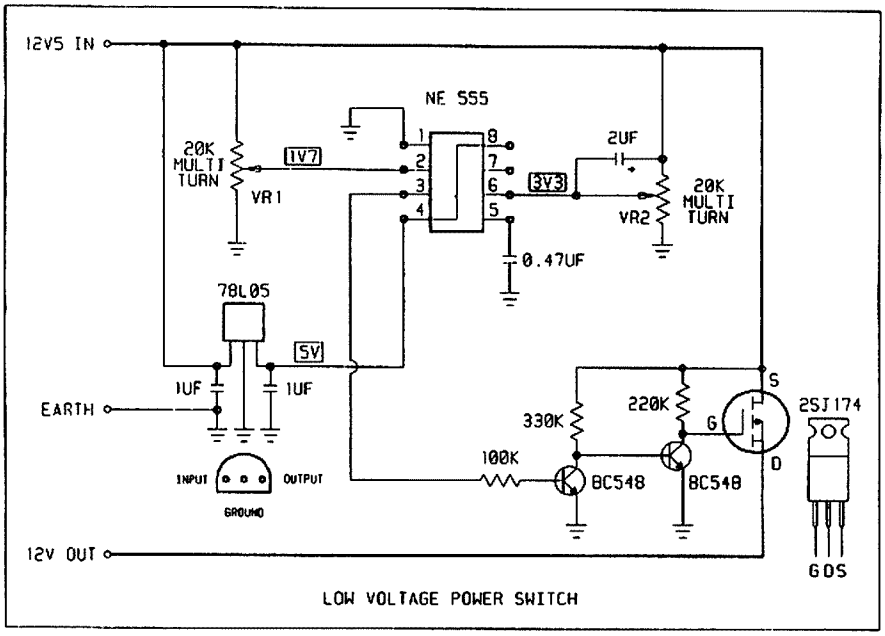
The two BC548 transistors are needed as the gate voltage must be supply rail (12V) for off, and 0 volts for on. As the NE 555 runs from a regulated 5 volt rail, the output is only 0 to 5 volts.

The circuit requires only 6 mA for the NE 555 version, and 4 mA for the NE 7555 CMOS version. Temperature variations had no effect on the switch off and switch on points.

Don't save costs by substituting ordinary trim pots for multi turn pots, as the preset voltages becomes too difficult to set.

P channel POWER MOSFETs are not as easy to find as N channel POWER MOSFETs, but they can be obtained from Farnell Electronic Components in Sydney, telephone (02) 645 8888. The price is around $7 each.

ar



LOW VOLTAGE POWER SWITCH

Spotlight on SWLing

Robin L. Harwood VK7RH 52 Connaught Crescent West Launceston TAS 7250

The central European nation of Czechoslovakia ceased to be as of January 1st, splitting into two sovereign republics. The regions of Bohemia, Moravia and Silesia form the Czech Republic with Prague as its capital. Bratislava is the capital of the Republic of Slovakia. Two thirds of the Czechoslovakian population are in the Czech Republic and the remaining third are in Slovakia.

On the 31st of December, I monitored the final English broadcast of Radio Czechoslovakia International at 0700z and the programme was light-heartedly merry . The announcers stated that they had been fired, hoping that they were going to re-employed by the new management.The next day at 0700z I tuned into the same frequency but the callsign of the station had reverted to Radio Prague and the tone was somewhat sombre. Apart from a brief news bulletin, the 25 minute English programme gave a background briefing leading to the momentous events, reflecting the Czech position that it was the fault of the Slovaks that led to Czechoslovakia ceasing to exist.

I haven't heard the Slovak External Service yet on Shortwave but Radio Prague can be easily heard in English on 11990, 7345 or 9505 kHz at 0700z. It also states that it is on 15355 kHz plus the above channels at 1100z. It still uses the same Interval Signal as Radio Czechoslovakia International.

At the end of November 1992, a QSL card and program schedule from Radio Yugoslavia arrived here, some eight months after being posted in Belgrade. The surface mail delivery could have been the result of the UN sanctions and the cessation of direct air links between Australia and the former Yugoslavia.

Recently, I replied to a classified advertisement in the local daily newspaper for old valve radios. As I have an old Philips dual wave 5 valve set, I was curious to know if there is any interest in collecting old valve sets. And there is a healthy if not rather heated interest in these, with dealers in memorabilia on the lookout for old valve models to sell to interstate collectors. So if you have an old valve set tucked away in the attic, don't be too hasty to throw on the junk pile, as it may be worth something to a collector. I would recommend that you deal directly with a reputable collector or dealer, as there may be some with questionable practices.

The Philips model 2262 I have resurrected from the storeroom is circa 1938, and remarkably is still operational. The tonal reproduction is quite good especially on medium wave. On shortwave, it performs quite well, despite its limited selectivity compared to that on the Icom R71 receiver. In fact, I found it indispensable when the phase locked loop on the Icom suddenly dropped out when I was making a recording of a special Christmas Day edition of "Letterbox", over the World Service of the Christian Science Monitor. I was interviewed on how Christmas is celebrated in Tasmania.

Well, that is all for this month. Until March, the very best of monitoring and 73 — Robin L. Harwood VK7RH. **ar**

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets the passing of:

V W (Bill)	Bayliss	VK2BVW
R J (Robert)	Bleakley	VK2EB
M P	Edwards	VK2EFE
R R	Ross-Wilson	VK2FIT
H (Harry)	Hocking	VK2HH
G (Geoff)	Hughes	VK3AUX
J S (John)	Adkins	VK2ZBA
F N	Hymus	VK4AEV
S (Stan)	Tonkin	VK5SG
H M	Temby	VK5ZJ
B F (Basil)	Holman	VK6VB
F L	Powell	VK7FL

OBITUARY

Stan Tonkin VK5SG

Stan died peacefully on 3rd December 1992, aged 81.

For the last two years, he had lived at the Helping Hand Centre at North Adelaide, and passed away at the Adelaide Hospital.

He was active to the end maintaining regular skeds with his circle of friends.

Stan had a long and distinguished career in radio with AWA installing broadcasting stations in Australia and New Zealand, in addition to maintaining ships radio stations.

He was associated with the rocket program at Woomera, and was regarded by all as a very fine and quiet gentleman, as well as being a brilliant engineer who will be sadly missed.

Bob Clifton VK5QJ

Basil Holman VK6VB

7th April 1905 — 25th December 1992.

Born in England, but raised and educated in Beverly WA where he first dabbled with radio.

Basil served an apprenticeship as a fitter and turner with the State Engineering Works.

He worked throughout the wheat-belt finally arriving in Kalgoorlie, were he found work with the Tramways. He also studied for and received an "A" class welding certificate.

In 1939 he purchased and studied the necessary books to obtain an "A" grade electrician's licence.

In 1949 he moved to the mining sector as a foreman electrician, a job he held till 1954.

His very active mind and manual skills enabled him to make many things from radios to a steam engine for his car.

Keen fishermen are grateful to him for the invention and manufacture of the "Holman Cliff Gaff" that allowed them to bring home the big ones.

At the age of 75, Basil taught himself CW with the aid of a Datong morse trainer, and he sat for and gained his amateur licence. From the day he received his licence he held regular bi-weekly skeds with Wally ZS6WE in South Africa, a true friend, whom he met and stayed with on several occasions.

Basil, a great family man will be sadly missed by all who knew him.

Ron Law VK6RL

ar

Stolen Equipment

Stolen from a motor vehicle on 16th December 1992:
ICOM IC 735 Transceiver S/N 020254, with mounting bracket and mic, YAESU SP4 extension speaker, WELZ SWR/Power meter.

Details to Brian Woods VK2AZI, 21 Careebong Road, Frenchs Forest 2086.

Stolen from Dick Smith Electronics, YAESU FT470 VHF/UHF Dual Band FM Handie Transceiver, Serial No 1 K 430817. Contact George Alexandrakis, Area Manager, Dick Smith Electronics, 656 Bridge Road, Richmond Vic 3121 Tel (03) 428 1614.

ar

Divisional Notes

VK2 Notes

Tim Mills VK2ZTM

Annual General Meeting

As detailed in the Articles of Association for the WIA NSW Division, members are advised that the 1992/93 AGM for the Division has been scheduled for Sunday afternoon 2 May 1993 at Amateur Radio House, 109 Wigram St, Parramatta NSW.

The formal notice and reports will be given in the separate insert with the April Amateur Radio delivery.

Members are advised that agenda items and other matters for inclusion in the meeting business paper must be received by the secretary at the registered office of the Division, 109 Wigram St, Parramatta by 2pm on Wednesday 17 March 1993.

Nominations are also called from full members of the WIA NSW Division to serve on the 1993/94 Divisional Council. Nominees must be proposed and seconded by full members of the Division. (Forms are available from the office). These nominations must also be received by the secretary at the registered office, 109 Wigram St, Parramatta NSW by 2pm on Wednesday 17 March 1993.

The Divisional Council consists of nine members who, upon election, become directors of the Division — a company registered in the State of New South Wales, as required by the respective Companies Acts etc.

Should more than the required number (nine) be received by the close of nomination, a ballot will be conducted.

Divisional happenings

Divisional membership promotion. See the notes in January AR; this is the last month.

The current Australian Callbook has been selling well, but don't delay if you want a copy. The Divisional Bookshop still has a couple of copies of the now out-of-print RSGB RTTY Handbook on the shelves. Mainly covers the days of the mechanical machines. Anyone out there interested? Contact the office via the methods shown on page 3.

Divisional classes for 1993 have just started Monday nights in the library at Parramatta; ring or call in for details. Remember, the Division also has the correspondence course available to anyone unable to get to Divisional or Club classes. The Gladesville ARC has courses available on video tape; the office can give you details.

The first exam at Parramatta for the year is Sunday 21 February, with a close-off date of 4 February. The next exam is in May.

The Hunter Branch Monday evening broadcast at 7.30pm resumes 8 February when you can catch a summary of the VK2WI Sunday sessions.

VK2WI news can also be found on the various packet and electronic systems. For voice highlights, telephone (02) 552 5188.

The next Parramatta located Trash & Treasure is 28 March 1993.

The committee formed from last year's Packet forum is to meet this month. Some upgrading of the VK2RWI packet system has been carried out recently.

There was a good turn-up to the end-of-year broadcast barbecue, which prompts the question: is there any interest in re-starting the monthly Dural barbecues?

VK4 Notes

From the WIAQ Minutes Summary of the meeting held on 3rd December 1992 supplied by Ken Ayers VK4KD, WIAQ Division Hon Secretary, and compiled by VK3UV.

John Aarse VK4QA presided. Matters discussed in committee were News Broadcasts and examination issues.

IARU Region 1

A written request has been made from IARU Region 1 to supply details of the Australian Standards and Regulations for the Amateur Service.

Tower Dispute

It has been reported that a Tower Dispute exists with the Rockhampton City Council.

QTC Insert

Due to late deliveries by Australia Post, resulting in many members not receiving the insert, alternative arrangements are being made for the inserts to be transferred to the Melbourne mailing house.

Examinations

A proposal for monthly examinations in the Brisbane/Coastal area is being investigated. It is generally considered that regular monthly exams, properly advertised, would benefit everyone. More on this later.

Slow Morse

Sunshine Coast Amateur Radio club has been granted permission for the club call sign VK4WIS to be used on a roster basis by Slow Morse Stations.

UHF Repeaters

70 cm repeaters for the Monto and Bundaberg areas are currently being considered by the QTAC.

General

The Divisional Council is concerned about a retailer advertising amateur equipment without the customary warning that it is unlawful to operate same unless the operator holds the appropriate licence. The matter is being watched.

Bert Hinkler Centenary

The WIAQ commemorated this important centenary by having a special broadcast on 14.160 MHz at 0730Z on 6th December 1992. The mayor of Bundaberg (where Hinkler was born) spoke from Bob Millgate's station (VK4ADZ) to the RAF Aircraft Museum at Hendon UK (G0SJR), the RSGB HQ GB3RS, near London. Also in the world wide hook-up was the president of the Queensland Aero Club Museum in the Hinkler room at Archerfield. This station was set up by Laurie Pritchard VK4BLE. Other stations involved were VK4LC, VK4KD, GX3GXI Eccles Club, Manchester, G3VUH and G4TLY both relay stations.

Greetings were sent from the WIAQ to the RSGB.

Gosford Field Day

Visit the various Divisional stands while you are there on Sunday 28 February. Note the new venue this year of the Wyong Racecourse. Note that for this weekend the Sunday morning VK2WI broadcast is conducted Saturday evening; the tape at 1745 and the news at 1800 local.

New members A warm welcome is extended to the following who joined the NSW Division last December.

JP	(Peter)	Bulanyi	VK2GVO	Dorrigo
HKJ	(Hans)	Goldhofer	VK2GOL	Randwick
FA	(Fred)	Gubbins	Assoc	Coffs Harbour
RT	(Robert)	Heaton	Assoc	Dee Why
A	(Aiden)	Kavanagh	Assoc	Merrylands
C	(Clive)	Luckman	VK2GUX	Queanbeyan
F	(Frank)	Mike	VK2DHM	Fishing Point
S	(Shane)	Norman	Assoc	Sylvania
MJA	(Matt)	Ryan	Assoc	Coogee
D	(David)	Thomas	Assoc	Sydney
P	(Paul)	Titze	Assoc	Granville

5/8 Wave

Jennifer Warrington VK5ANW

Well, I bet you were surprised to see my name at the top of this column again, but no more than I was when Bob Allan VK5BJA rang to ask if I could fill in for this month. My first reaction was "what on earth can I write?" I have got rather out of touch over the past few months.

The pottery classes I have been attending were on Tuesday nights, which has meant I have not attended any WIA meetings since about August. Also, the arrival of our four-year-old grandson on alternate Sundays, prior to the start of the broadcast, means I don't always hear it, even though it is on. However, I have managed to catch up with a few people in that time and know a bit of what has been going on.

What looked like a new and exciting Council line-up in April seemed to slowly disintegrate in the following months. First, John Highman VK5PJH had to leave to become a VK2, just as he was coming to grips with the secretary's job. Then Mark VK5AVQ decided our wet winter was just too much, so he left to spend some time with the penguins! Chuck VK5CQ also resigned, and so the remaining members of council struggled along as best they could, trying to keep the wheels turning.

Rowland VK5OU, who had already agreed to take over this column and the minutes secretary's job, suddenly found he was the correspondence secretary also. Anyway, I am pleased to announce there is light at the end of the tunnel. Maurie Hooper VK5EA and Garry Herden VK5ZK have both volunteered to go on council. My information was that Maurie would possibly be secretary, but I also read in the last journal that he may be our new journal editor, so who knows, maybe he'll do both!

Whatever either of them does, I know they will do it very diligently, and that it will be greatly appreciated by the other members of council. I also understand the education/membership/examinations portfolio has been taken care of, but that's all the information I have. I do know the position of program organiser is still vacant, so if you think you could help, do speak to a member of council.

This is probably a good time to remind everyone that nomination forms for the AGM in April are now available. If you haven't got one, again, PLEASE contact a member of council; there are still vacancies, and wouldn't it be a nice change to actually have to vote for a council this year?

I am still working on the photographs of our past presidents. A couple of months ago I wrote to the nine for whom I do not have photographs. My thanks to Les Diener VK5NJ and Don McDonald VK5ADD for theirs, and to Ian Hunt VK5QX and John Haseldine VK5BD, who have promised theirs. I'm still hoping to hear from the rest!

Wishing you all a happy, healthy and fulfilling 1993.

VK7 Notes

E A Beard
VK7 Divisional Secretary

VK7 Annual General Meeting

All members please note the Annual General Meeting of the VK7 Division shall be held at the registered office of the Institute, 105 New Town Road on 27 March 1993, commencing at 2pm.

All Notices of Motion for the AGM must be received by the secretary not less than 28 days prior to the meeting, and must be signed by at least three currently financial members.

Nominations of candidates for elections to the Divisional Council must be received by the secretary, in writing, not less than 21 days before the AGM.

Not less than 10 days before the AGM, should an election be necessary, a ballot paper shall be posted to each member of the Institute, which is to be returned to the secretary prior to the commencement of the AGM.

Proxies are to be deposited at the registered office of the Institute, 105 New Town Road, Hobart, at least 24 hours before the time appointed for the meeting.

All of the above items are in accordance with the Articles of Association.

ar

IARUMS — Intruder Watch

Gordon Loveday VK4KAL Federal Intruder Watch Co-ordinator
Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4UN-1

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Simplified Intruder Watching

Please read the following, it applies to all amateur bands and all intruders.

WIA members seem very loath to act as IW Observers, and one suggestion put forward amounts to this — instead of members taking on "official observer" status, they be more free and not obligated by that status. The idea is that members keep alongside them on their operating desk a copy of the Observer Log Sheet.

In listening around the bands, or in normal operating, when an intruder is heard an appropriate entry would be made on the form, and at the end of each month the sheet/s would be forwarded to your Divisional Co-ordinator (see below).

From your standpoint this would take the onus of being "official" off your shoulders, and I urge ALL members to start NOW to stimulate more activity in intruder watching to make it the success it should be.

The Intruder Watch Service works in this way: Say, for instance, on some occasions your favourite net or frequency is subjected to harmful interference from a non-amateur transmission and you want to do something about it. You note the occurrence on the observer's log sheet, making as many observations as you can on different days, then at the end of the month you forward the sheet/s to your co-ordinator. Many reports will bring results, BUT not just an isolated report. So get all the participants on the net also to send in their findings. Thus, after a while, you will be used to doing this, and many reports will be received and some action taken. Identifications are essential to get action taken. Although identifications are desirable, what you hear without an ID could be most useful to tie in with somebody else who has text and nothing else. By being alert to intruders when operating, I am sure will make your listening much more interesting, and shortwave listeners, so long as their equipment is accurate, can participate. Be enthusiastic; note ALL infringements you hear, and send in your sheets monthly. They will be

much appreciated and will be used to condemn those countries which allow stations to intrude into our amateur bands. You will be doing a great service to amateur radio as a whole, and it will pay dividends.

Log sheets are available from the following co-ordinators: VK4BTW Tom Walker, 13 Bothwell St, Toowoomba 4350; VK5ZRH John Harris, 7 Prince Charles St, Morphett Vale 5162; VK6RO Graham Rogers, 22 Grace St, Ferndale 6155; VK7RH Robin Harwood, 52 Connaught Cres, West Launceston 7250.

Or from the Federal Co-ordinator at this address: **Freepost No 4, AG Loveday, Rubyvale 4702.** Observers in states having no co-ordinator should send their log sheets direct to this address.

Please keep log sheets beside you at all times.

My thanks to Alf VK3LC for the original text. Although slightly altered, it was good advice in 1978; it is even better today.

ar

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

What's In a Name?

"A rose by any other name would smell as sweet!", wrote William Shakespeare.

I have been following the correspondence about the Institute's name, and would ask you to add my name to the list of those who see no necessity for change.

WIA is the oldest National amateur radio organisation in the world, and dates several decades before the word "radio" became King's English, which was when King Edward VIII used it in one Christmas broadcast. "Wireless" is still in current use. United Kingdom Amateur Radio licences are issued under the "Wireless Telegraphy Act, 1949", and my copy of the Australian Dept of Communications pamphlet RB29 states, on page 1, "A Wireless Telegraphy Act licence is for the specific period shown....".

The word "Institute" is also a bit old fashioned, but there's no merit in becoming the "Radio Society of Australia". The acronym would clash with that of the Royal Society of Arts! Those wanting change might reflect that the present name is still more apposite these days than that of the United States of America counterpart.

WIA has a long and honourable history. Let its title reflect the facts.

E Arnold Matthews
G3FZW/ex VK4AUN
2 The Parchments
Litchfield
Staffordshire
WS13 7NA
ENGLAND

Do not Change Name

I would like to add my total support to the feelings expressed by Lloyd Butler, VK5BR, in respect to the name of the WIRELESS INSTITUTE OF AUSTRALIA, which appeared in the October 1992 issue of AR.

Murray Burford VK5ZQ
261 Belair Rd
Torrens Park SA 5062

Preferred Description

I am writing in response to the *WIA NEWS* item in this month's AR (Dec 1992, page 4) titled *"Amateur Radio in the Yellow Pages".*

This is certainly not before time, but may I suggest that newcomers to the hobby will be looking under Clubs, Radio rather that Clubs, Amateur.

Let's make it easy for people to find us. Those with little or no knowledge may even look under Clubs, Ham Radio.

I think we should look at ourselves from their point of view first of all.

Gareth Davey VK2ANF
12/18 Grafton Crescent
Dee Why NSW 2099

Mailing Costs

Noticing that my journal had been delivered by Streetfile, it occurred to look at the present value of the 3d letter rate postage in 1939 in today's money.

Assuming an average 3% inflation over the period, probably too low, possibly believable, letter rate postage comes out just under 12c.

But the airmail rate of, say, 35c, has been absorbed into the letter rate.

In present day terms of number of items handled, distances involved, and service time (typical), postal rates, though pricey, don't look expensive in terms of value for money from out here.

What's likely to be the 2nd Class Mail rate to Coonabarabran, or Booboorowie, or Queenstown, or .... when mail between capitals can go outside the system at, say, a cost-effective rate of 20c?

No thinking yet heard from either major side of politics to account for (or discount) this risk.

Ian Crompton VK5KIC
9 Craig St Richmond SA 5033

Abject Error recognised, change "AR" Instead!

I have read with interest the letters in "Over to You" in response to my proposal last year that the WIA change its name to the Amateur Radio Institute of Australia.

Having read Lloyd Butler's poignant plea in the October 1992 issue, and Jeroen Vette's followup in the December issue, I am convinced to change my mind, as I have seen the abject error of my ways.

We should NOT change the name of the Wireless Institute of Australia!

However, under the principles espoused by the above-mentioned correspondents, to which I now subscribe, I propose that we must change the name of the WIA journal from "Amateur Radio" to "Amateur Wireless"!

After all, the commercial/professional community now refers to "wireless personal communications technology" and "wireless local area networks", so let us keep in step with the times!

Roger Harrison VK2ZTB
3/3 Rosemont Ave
WOOLLAHRA NSW 2025

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	Price to Members
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25' IBM Disk	BX293	$18.00
Antenna Collection — HSGB	BX391	$39.60
Antenna Compendium Vol 1 — ARRL	BX183	$19.80
Antenna Compendium Vol 2 — ARRL	BX292	$21.60
Antenna Impedance Matching — ARRL	BX257	$27.00
Antenna Note Book W1FB — ARRL	BX179	$18.00
Antenna Pattern Worksheets Pkt of 10	BX902	$2.70
Antennas 2nd ed John Kraus — 1968	BX259	$93.60
Easy Up Antennas	MFJ38	$35.30
G-QRP Antenna Handbook	BX452	$20.30
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX162	$14.40
Physical Design of Yagi — 3.5' IBM Disk	BX388B	$18.00
Physical Design of Yagi — 3.5' Mac Disk Excel Format	BX388C	$18.00
Physical Design of Yagi 5.25' IBM Disk	BX388A	$18.00
Physical Design of Yagi Antennas — The Book	BX366	$36.00
Practical Antenna Handbook — Tab	BX028	$44.10
Practical Wire Antennas — RSGB	BX296	$25.20
Reflections — Software 5 inch disk	BX356	$18.00
Reflections Transmission Lines and Antennas — 5.25' IBM	BX348A	$18.00
Reflections Transmission Lines and Antennas — ARRL	BX346	$36.00
Simple Low Cost Wire Antennas	BX216	$23.00
Smith Chart Expanded Scale PK of 10	BX903	$5.90
Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$5.90
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$5.90
The Antenna Handbook — ARRL 1991 edition	BX370	$38.00
The Easy Wire Antenna Handbook	BX002	$18.00
Transmission Line Transformers — ARRL	BX329	$38.00
Vertical Antenna Handbook — Lee — 1990	BX284	$19.60
Yagi Antenna Design — ARRL	BX164	$27.00
ATV		
An Introduction Amateur TV	BX369	$18.00
The ATV Compendium — BATC	BX270	$15.60
The Best of CQ-TV volume 2	BX273	$15.60
CALL BOOKS		
Radio Call Book International 1993	BX339	$62.90
Radio Call Book North America 1993	BX336	$68.50
FICTION		
CQ Ghost Ship — ARRL	BX204	$9.50
Death Valley QTH — ARRL	BX205	$9.50
DX Brings Danger — ARRL	BX206	$9.50
Grand Canyon QSO — ARRL	BX207	$9.50
Murder By QRM — ARRL	BX208	$9.50
SOS At Midnight — ARRL	BX209	$9.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$47.60
Electronics Data Book — ARRL	BX201	$21.60
Mobile Radio Handbook	MFJ33	$22.50
Motorola RF Device Data — 2 Volumes	32.0	$32.00
Radio Communication Handbook — RSGB	BX266	$50.40
Radio Theory For Amateur Operators — Swainston — 1991	BX267	$43.20
Space Radio Handbook — GM4IHJ — RSGB	BX439	$49.50
World Radio TV Handbook	BX450	$38.00
HISTORY		
200 Meters and Down 1938 — ARRL	BX198	$7.20
50 Years of the ARRL — 1981	BX196	$7.20
Big Ear — Autobiography Of John Kraus W8JK — 1978	BX263	$11.70
Bright Sparks of Radio — RSGB	BX394	$39.60
Dawn of Amateur Radio	BX395	$52.20
Golden Classics of Yesterday — Ingram	MFJ30	$19.40
Spark to Space — ARRL 75th Annrversary	BX310	$22.50
INTERFERENCE		
Interference Handbook — Nelson — 1969	BX181	$23.00
Radio Frequency Interference — ARRL — 1992 Edition	BX186	$27.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$9.50
Design Note Book W1FB — ARRL	BX357	$15.00
Ferrells Confidential Frequency Listing	BX367	$37.80
Ferromagnetic Core Design & Application Handbook	BX135	$69.30
First Steps in Radio — Doug DeMaw W1FB	BX385	$10.80
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$27.90
Ham Radio Communications Circuit Files	MFJ37	$22.50
Help For New Hams DeMaw — ARRL	BX306	$18.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$16.20
National Educational Workshop 1991 — ARRL	BX384	$21.80
Novice Notes, The Book — QST — ARRL	BX296	$10.80
QRP Classics — ARRL — QST	BX323	$21.60
QRP Note Book — DeMaw — ARRL	BX170	$18.00
Radio Astronomy 2nd edition — John D Kraus — 1966	BX262	$71.90
Radio Auroras — RSGB	BX381	$27.00
Radio Buyers Source Book — ARRL	BX377	$27.00
Shortwave Receivers Past and Present	BX253	$19.80
Solid State Design — DeMaw — ARRL	BX171	$21.60
Vibroplex Collectors Guide	BX025	$31.50
MORSE CODE		
Advanced Morse Tutor — 3.5' Disk	BX326A	$36.00
Advanced Morse Tutor — 5.25' Disk	BX326	$36.00
Morse Code — The Essential Language	BX223	$9.00
Morse Code for Radio Amateurs — RSGB	BX451	$14.40
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$16.70
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$16.70
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$16.70
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$16.70
Morse Tutor 3.5' IBM Disk	BX187A	$18.00
Morse Tutor 5.25' IBM Disk	BX187	$18.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$27.00
Amateur Techniques — G3VA — RSGB	BX393	$32.40
DXCC Companion — How to Work Your First 100	BX345	$10.80
DXCC Country Listing — ARRL	BX386	$4.50
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.20
Locator Map of Europe — RSGB	BX396	$5.40
Log Book — ARRL — 9' x 11' Wire Bound	BX202	$8.30
Low Band DXing — John Devoldere	BX195	$18.00
Operating Manual — ARRL — 4th Edition	BX192	$32.40
Operating Manual — RSGB	BX359	$27.90
Passport to World Band Radio	BX348	$30.60
Prefix Map of North America	BX235	$7.20
Prefix Map of the World — RSGB (laminated)	BX397	$18.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$16.20
Short Wave Propagation Handbook	BX268	$16.20
The Complete DXer — W9KNI	BX194	$18.00
Transmitter Hunting	BX222	$38.70
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$9.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$14.40
Gateway to Packet Radio 2nd edition — ARRL	BX169	$21.60
Packet Computer Networking Conference 1-4 1982/5	BX168	$32.40
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$22.50
Packet Computer Networking Conference No 5 1986 — ARRL	BX167	$18.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX188	$18.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX164	$22.50
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$18.00
Packet Radio Made Easy — Rogers	MFJ32	$16.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$28.80
Packet Users Notebook — Rogers	BX285	$16.70
SATELLITES		
Oscar Satellite Review — Ingram — 1986	MFJ31	$15.30
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$15.80
Satellite AMSAT 8th Space Symposium — ARRL	BX199	$15.30
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$21.60
Satellite Anthology — 1992 Edition — ARRL	BX180	$18.00
Satellite Experimenters Handbook	BX177	$38.00
Space Almanac — ARRL	BX299	$45.00
Weather Satellite Handbook — ARRL	BX324	$38.00
Weather Satellite Handbook Software 5.25' IBM Disk	BX326	$18.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$15.60
International VHF FM Guide — G3UHK — RSGB	BX399	$12.60
Microwave Handbook Vol 1 — RSGB	BX318	$34.20
Microwave Handbook Vol 2 — RSGB	BX437	$51.30
Microwave Handbook Vol 3 — RSGB	BX447	$51.30
Microwave Update Conference 1987 — ARRL	BX174	$15.80
Microwave Update Conference 1988 — ARRL	BX183	$15.80
Microwave Update Conference 1989 — ARRL	BX321	$21.60
Microwave Update Conference 1991 — ARRL	BX446	$21.60
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.70
Spread Spectrum Source Book — ARRL	BX365	$38.00
UHF Compendium Part 1 & 2 Vol I	BX250	$67.50
UHF Compendium Part 3 & 4 Vol 2	BX251	$87.50
UHF Compendium Part 5 German Only	BX354	$58.30
UHF/Microwave Experimenters Manual — ARRL	BX325	$36.00
UHF/Microwave Experimenters Software — ARRL	BX327	$18.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.70
VHF 23rd Central States Con. 1989 — ARRL	BX288	$18.70
VHF 24th Central States Con. 1990 — ARRL	BX322	$22.50
VHF 25th Central States Conference 1991 — ARRL	BX438	$22.50
VHF 26th Central States Conference 1992 — ARRL	BX448	$22.50
VHF West Coast Conference 1992	BX444	$22.50
VHF/UHF 16th Eastern Conference — ARRL	BX445	$22.50
VHF/UHF Manual — RSGB	BX267	$43.20
WIA MEMBERS SUNDRIES		
Log Book Covers		$18.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.80
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.80
WIA Novice Study Guide		$1.50

Not all above are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only — postage and packing, if applicable, is extra. (Phone for postal rates.)
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

ANNUAL INDEX 1992

Videotape Library

WIA Videotape Library
c/- Bob Godfrey VK4BOB
20 Buckra Street Brackenridge, QLD 4017
ph (07) 840 6750 (bus) — (07) 269 5380 (home).

Now every radio club can provide its members with quality technical lectures on subjects covering the whole range of Amateur Radio activities by taking advantage of the WIA Federal Videotape Library. You'll find this a boon particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for its regular meetings. (Individual Amateurs and Librarians should take note of the duplication fees at the end of this article.)

For radio clubs affiliated with the WIA it's inexpensive and easy. Here's how it works. For those titles which the WIA has placed in the public domain, all you have to do is supply the WIA Video Co-ordinator (address above) with:

— a list of requested titles,
— a blank video cassette,
— a VCB Postpak ,
— and enclose your address and stamps for return postage.

The program is then free for your use in the support of Amateur Radio in your area, including duplication and transmission over Amateur Television if you wish.

Those programs which are copyright are indicated by the © symbol and are available only ON LOAN. To obtain any Loan Item supply the WIA Video Co-ordinator (address above) with:

— your requested title,
— information about your preferred VCR format,
— enclose your address and stamps for postage to you,
— and a statement signed by a responsible member of your club that "I undertake that while (program title) is assigned to me, I will not allow it to be copied or transmitted by any means whatsoever, and that I will return the same promptly after showing".

Note: the WIA does not hold a licence from the copyright owners of certain titles; therefore no loan or copy service is available for those so marked; they are held for WIA Archive purposes only.

The present "preferred VCR format" is Standard Play VHS. For estimation of postage, a 3 hour VHS cassette measures 200x100x30mm and weighs 350gm.

New Air-Mail Postal Regulations. To avoid disappointment by lack of arrival of late-minute requests, this important change in Postal Regulations should be allowed for by Club Activity Organisers. All packages being sent by Airmail MUST now carry a declaration sticker certifying that the contents are not dangerous or prohibited. For items weighing less than 500 gm. (ie one VHS cassette) pink stickers are obtainable from any Post Office. Items weighing more than 500 gm can only be posted at an official Australia Post Office and a complete declaration of contents must be made. Any item not carrying the correct sticker will not be transported by air, regardless of whether the correct value of stamps for Air Mail have been affixed.

A note to individual amateurs. From the inception of the WIA Federal Video Service cassettes were freely available to all comers. However, in order to stem the rising tide of requests for copies of programs from individual amateurs (some of whom asked for over 10 hours of programs at a time) there is now a duplication fee (payable in advance) of $2 per hour or part thereof to individuals. Isolated or disadvantaged individual amateurs will however continue to receive free concession.

A note to librarians. A number of educational institutions have already availed themselves of the of the WIA technical lecture tapes. A duplication fee of $10 per hour or part there-of is payable in advance by all institutions not affiliated to the WIA.

Finally, a note regarding cassette quality. The WIA Videotape Co-ordinator reserves the right to refuse to copy onto inferior quality video tape. Video dubbing is a real-time, one-at-a-time operation and in the past low quality tape has been the cause of many lost hours due to clogged heads etc. Libel laws prevent publication of a list of manufactures of suspect tape, however most of the well known brand names are acceptable; in particular use only those tapes bearing the official "VHS" logo.

WIA Videotape Program Title Listing as of 1/1/93

NOTE
"c" = Copyright; no copy service
"*" = Optically Converted to PAL from NTSC by WB2LLB; noticeable flicker.
"w" = available ONLY to Radio Clubs Affiliated with the WIA as per agreement with OTC
"o" = program now out of date
Standard Format: "VHS" Standard Play.

Support the WIA in order to protect amateur radio frequencies

See Note	Title	Lecturer	Producer	Approx Duration	Col/BW	Year Produced	Description
Amateur Radio — Historic Interest							
c	Wireless Telegraphy-circa 1910		?	10mins	B&W	1910	Archive material courtesy David Wardlaw VK3ADW
c	Amateur Radio:TV Pilot		WIA NSW	30mins	B&W	1968	Archive material courtesy TEN channel 10
-	Opening for Burley Griffen Bldg SA HQ		VK5KG	45mins	Col	1977	Archive material
-	ATV in Australia 1978 made for British ATV Club		VK5KG	30mins	Col	1978	Archive material
-	ATV in United Kingdom 1978 reply from BATC		G8CJS	30mins	Col	1978	Archive material
-	ATV in Australia 1980/81 Made for British ATV Club		VK5KG	60mins	Col	1980	Clips from ATV Groups in VKs 2,3,4,5 & 7
-	History of ATV in South Australia		VK5KG	30mins	Col	1980	Archive material, still building
-	ATV in United Kingdom 1978/81		G8CJS	30mins	Col	1981	Remake of their previous effort
o*	CQ ATV DX International 1983		WB2LLB	60mins	Col	1983	ATV in USA and Europe
-	High Definition TV Tutorial	Don Fink	WB2LLB	60mins	B&W	1983	A look at what is to come in Broadcast TV
-	ATV Hamfest, York Pennsylvania Sept'83	Various	WB2LLB	6hrs	Col	1983	Various ATV technical lectures from USA
-	Opening of Amateur Radio House — NSW HQ		VK2BDN	102mins	Col	1983	Archive material
-	ATV in Victoria, 1984		VK3AHJ	54mins	Col	1984	Courtesy of "Tbe Roadshow Gang"
c	"Journey to the White Volcano" The Heard Island Dxpedition				Col	1983	
c	Heard Island Dxpedition		ch 2,7,9,10	20mins	Col	1984	Archive material; NO LOAN OR COPY AVAILABLE
-	Keynote speeches by Fed Pres David Wardlaw & State DOC Manager John Milton		WIA NSW	135mins	Col	1985	From WIA 75th Anniversary Seminar
-	Heard Island Dxpedition	VK2BCC	WIA NSW	60mins	Col	1986	Raw Unedited; from 1986 VK2 Seminar
Amateur Radio — Promotional							
o	The Ham's Wide World		ARRL	27mins	Col	1969	Superseded by "The World of Amateur Radio"
-	This is Amateur Radio		ARRL	15mins	Col	1970	Pitched at teenagers
-	Moving Up to Amateur Radio		ARRL	11mins	Col	1975	Pitched at CBers
c	7J1RL DXpedition		JARL	60mins	Col	1976	General Amateur Radio interest; LOAN ONLY
-	This Week has 7 Days looks into Amateur Radio		HSV7	25mins	Col	1978	Pitched at teens; includes some ARRL footage.
o	The World of Amateur Radio		ARRL	26mins	Col	1978	Superseded by "The New World of Amateur Radio".
-	Amateur Radio — The National Resource of Every Nation		VK5KG	6mins	Col	1979	Encapsulates AR; good for public exhibitions
-	Amateur Radio — The National Resource of Every Nation		VK5KG	60mins	Col	1979	Continuously running version available ON LOAN
-	The New World of Amateur Radio		ARRL	28mins	Col	1988	Supersedes "The World of Amateur Radio"
Antennas							
c	G6CJ's Aerial Circus	G6CJ	WIA	90mins	B&W	1977	THE Definitive Antenna Lecture; LOAN ONLY
-	Wire Antennas	VK5RG	VK5KG	40mins	B&W	1978	Antennas for HF and Antenna Tuners
-	Loaded Wire Antennas	VK5NN	VK5KG	50mins	Col	1980	Using Inductive and Capacity loaded Antennas
w	Antennas and Directivity	VK2BBF	OTC	73mins	Col	1985	Lecture given to a group of Radio Amateurs
-	Antenna Rotator Systems	VK5AIM	VK5KG	50mins	Col	1986	Servicing the several different types
-	Broadband Antennas	VK5RG	VK5KG	62mins	Col	1986	Includes terminated antennas
ATV — Activity							
-	ATV Item from UK (via Doug VK6ER)				Col	1984	Unedited clips
-	Hello from America! Made for British ATV Club		WB0-QCD	100min	Col	1988	Clips from ATV Groups in the USA
-	VK5 ATV Call-in		VK5ZBD		Col	1990	Made for VK4XRL who had recently visited
ATV — General Interest							
-	Low Definition Television	Chris Long	VK5KG	25mins	Col	1982	Re-creation of TV as transmitted by Baird.
-	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6mins	Col	1983	ATV camera & TX mounted in a model aeroplane.
-	VK5RCN — Aust's first wind powered ATV repeater.	VK5KAU	VK5KG	61mins	Col	1986	Tour of VK5RCN by Barrey Bryant (silent key).
-	Australian TV History The Untold Story	Chris Long	VK5KG	56mins	Col	1988	Lecture to Radio Amateurs Old Timers Club.
-	Australian TV History — Part 2	Chris Long	VK5KG	49mins	Col	1988	Technical slides not used in the above.
-	The Development of the TV Test Card	George Hersee	G8PTH	43mins	Col	1988	Made for BATC by the BBC Training Dept.
-	TV for Amateurs		BATC	19mins	Col	1990	Excellent introduction to ATV
-	The first nation-wide ATV AUSSAT TX		Gladesville ARC	2hours	Col	1990	Noisy off-satellite but interesting.
ATV — Technical							
o	The Signal to Noise Story	VK3ATY	VK3AHJ	45mins	Col	1982	Superseded by "UHF Preamplifiers" (below).
-	UHF Preamplifers	VK3ATY	VK3AHJ	45mins	Col	1983	Explanation and demo. of low noise preamps.
-	Getting Started in Amateur Television	VK5KTV	VK5KG	55mins	Col	1983	How to set up an ATV station
-	Testing ATV Transmitters	VK5KG	VK5KG	50mins	Col	1983	How to correctly measure ATV systems.
Computers							
-	Demo. of VK5RTV's Micro-Computer Controller #1	VK5KG	VK5KG	10mins	Col	1979	First u-Computer controlled repeater in VK.
o	Understanding Micro-Processors	VK5PE	VK5KG	60mins	Col	1980	A somewhat dated technical description.
o	An ATV Hamshack Micro-Computer	VK3AHJ	VK3AHJ	30mins	Col	1981	Describes now unavailable microcomputer kit.
-	Getting Started in Amateur Micro-Computers	VK5IF	VK5KG	33mins	Col	1983	Demo of hard & software for Amateur Radio.
Data Transmission							
-	Getting Started in Amateur RTTY	VK5JM	VK5KG	85mins	Col	1983	RTTY using teleprinters and Micro-Computers.
-	Amateur Packet Radio	VK5AGR	VK5KG	60mins	Col	1984	Theory and Demonstration.
-	Packet Radio Lecture by Jim Swetlikoe				Col	1984	From WIA Seminar
-	Packet Radio — 10 months on	VK2KYJ VK2AAB	WIA NSW	65mins	Col	1985	Raw Unedited; from 75 aniv. VK2 Seminar.

See Note	Title	Lecturer	Producer	Approx Duration	Col/BW	Year Produced	Description
Amateur Radio — Historic Interest							
w	X25 Protocols and Packet Switching	VK2ZXB	OTC	47mins	Col	1986	Lecture given to a group of Radio Amateurs.
New	Amateur Satellites and Packet Radio	VK5AGR	Glades-ville ARC	130 mins	Col	1989	
Microwave Techniques							
-	Introducing Microwaves	VK5ZO	PJ Video	74mins	Col	1988	Des Clift gives a "Nuts & Bolts" expert technical lecture
Propagation							
-	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	50mins	Col	1983	How the Ionosphere aids HF communication
-	Moonbounce EME lecture by Lyle Patison	VK2ALU			Col	1984	From WIA Seminar
-	VHF Signal Enhancement by Aircraft	VK2ZAB	WIA NSW	70mins	Col	1986	Raw Unedited; from 1986 VK2 Seminar
New	HF DX Seminar with Iris & Lloyd Colvin		Glades-ville ARC	74 mins	Col	1990	
Satellites							
o	Getting Started in Amateur Satellites	VK5HI & VK5AGR	VK5KG	60mins	Col	1983	Superseded (see below)
o	An Introduction to Amateur Satellites (Pt 1)	VK5AGR	VK5KG	60mins	Col	1984	An overview of Amateur Satellite working
o	Micro-Computer Aids to Satellite Tracking (Pt 2)	VK5AGR	VK5KG	30mins	Col	1984	Programs for tracking & decoding telemetery
-	Using Phase III Amateur Satellites	VK5HI	VK5KG	90mins	Col	1984	History, construction & use of high orbit satellites.
-	The Amsat Oscar Phase 3 Story	DJ4ZC	VK5KG	80mins	Col	1985	Dr. Karl Meinzer "The Father of Oscar" includes film of launch.
-	Antennas for Satellites		WIA NSW	75mins	Col	1986	Raw Unedited; from Dr Trevor Bird's 1986 VK2 Seminar
New	Amateur Satellite Service What it has to offer	VK5AGR	Glades-ville ARC	190 mins	Col	1989	
New	Amsat Ground Control What is involved	VK5AGR	Glades-ville ARC	130mins	Col	1989	
Space — General Interest							
-	Apollo 13 Disaster	VK5JM	VK5KG	90mins	Col	1980	Australian tracking procedure saved Apollo 13
o	SSTV Pictures from Space — Voyager		VK5KG	15mins	Col	1983	SSTV pix converted from Saturn fly past
Amateur Radio — Historic Interest							
-	Aussat — Australia's Domestic Communications Satellite	VK5JM	VK5KG	62mins	Col	1984	Technical description of services offered
-	Amateur Radio's Newest Frontier		ARRL	26mins	Col	1985	Amateur Radio in Space; General PR.
-	Working W5LFL in orbit from VK10RR	Richard Elliot		23mins	Col	1986	Raw Unedited actuality footage
Miscellaneous							
-	An Auxiliary Battery Charger		VK5KG	30mins	Col	1981	Charging a second mobile battery
-	Lecture — Winning Foxhunts	VK5TV	VK5KG	45mins	Col	1981	How to do it from one who has!
-	Getting Started in Amateur Construction	VK5AIM	VK5KG	50mins	Col	1983	Mechanical hints for novice constructors
-	The Communications Consequences of Nuclear War	Dr John Coulter	VK5ZBD	60mins	Col	1983	Why your gear may not survive even if you do!
-	The Far Eastern Broadcasting Company		VK5KG	60mins	Col	1984	How a Short Wave Broadcaster operates
-	The Australian "Over the Horizon Radar"	Dr Phil Whitham	VK5KG	60mins	Col	1984	How the "Australian Woodpecker" works
-	What to Expect when the RI Calls!		VK5KG	34mins	Col	1984	by Geof Carter — a Dept of Communications Field Officer
-	A Future Shock — Lecture by Roger Harrison				Col	1984	From WIA Seminar
-	Radio Comm. Act — Lecture by Colin Oliver				Col	1984	From WIA Seminar
-	Doppler Direction Finding for Foxhumers	VK2BYY	WIA NSW	43mins	Col	1985	Raw Unedited; from 75 aniv VK2 Seminar
w	Fitting BNC Connectors		OTC	7mins	Col	1985	Correct Assembly of Crimp type BNC plugs
w	Handling Static Sensitive PCBs	Paul Tardent	OTC	6mins	Col	1986	Improving reliability of Printed Ccts.
-	Extra License Grades	VK2ZTB	WIA NSW	70mins	Col	1986	Raw Unedited; from 1986 VK2 Seminar
-	Thick Film Modules	VK5DI	VK5KG	45mins	Col	1988	Description of modules available from VK5 WIA
-	Quartz Crystals	VK5GL	VK5GL	106min	Col	1988	Clem Tilbrook gives a "Nuts & Bolts" expert technical lecture
New	How to survive in a Dog Pile	VK2DEJ	Glades-ville ARC	148 mins	Col	1989	
New	Making friends on DX	VK2SG	Glades-ville ARC	28 mins	Col	1990	

ar

WIA DXCC AWARD

Awards General Rules

Cost Free to all WIA members, VK non-members pay $A5.00 and others $US5.00 or 8 IRCs.

Verifications Applicants need to hold QSL cards for QSOs claimed. However, do not send QSL cards with your application. A list of all contacts is needed which should list the following information:-

Date, time, callsign of station contacted, frequency, mode.

Contacts should be listed in order of callsigns. At the bottom of this list should be a declaration signed by an official of a recognised Society or by two licensed amateurs. Signatories to the declaration should clearly indicate their names and callsigns.

Applications

— Applicants should state whether they are WIA members and, if so, list their membership number. Where relevant, changes in callsigns and dates of such changes should be indicated.
— All contacts for any particular award should be made from the same call area.
— Crossband contacts are not eligible, nor are those made through terrestrial repeaters, from aircraft, or to or from sea-going vessels.
— Where a fee is payable this should be sent with the application.
— In cases of dispute the decision of the Federal Awards Manager and two officers of the Federal Executive on the interpretation of these rules shall be final and binding.

Applications should be sent to Federal Awards Manager, Wireless Institute of Australia, PO Box 300, South Caulfield, Victoria 3162, Australia.

WIA DXCC Award

This award is available to all amateurs who submit evidence of having worked 100 countries,

and can be endorsed for various bands and modes. Acceptable countries are those that are acceptable for ARRL DXCC, with the WIA reserving the right to make different decisions in regard to additions and deletions.

Having obtained the DXCC award, holders may register subsequent claims for higher totals and these will be published from time to time in Amateur Radio magazine in the form of a ladder. No stickers to indicate these higher levels on certificates are available. Applications for higher totals should be made in multiples of 25 up to a total of 200 (i.e. 125, 150, 175, 200) and thereafter in multiples of 10 up to a total of 300. After a total of 300 is reached applications will be processed in one country steps or as required.

Should a country be deleted from the DXCC list, credit for that country will be allowed if worked before the date of deletion. The DXCC ladder will show the members tally of current countries and a total of current plus deleted countries e.g. 200/220 — meaning 200 current countries and an extra 20 that have been deleted at some time, but were worked before the date of deletion.

All claimed QSO's must be made from the same DXCC country.

General rules apply.

WIA DXCC Listings

The listings below are current as at 1st January 1993. If your particular listing is not shown, it is because you have not contributed to upgrades after 1st December 1987. It means that your listing has been removed from the active list and placed in the inactive list. In order to become active again, just supply an upgrade.

The above procedure of moving to inactive files will occur again on 1st December 1993. You may appreciate that this action has to be taken to avoid the active files from becoming too cumbersome.

WIA DXCC STANDINGS — PHONE

Honour Roll

CALLSIGN	COUNTRIES
VK5MS	323/373
VK4KS	323/365
VK4LC	323/365
VK5WO	323/354
VK6LK	323/343
VK6HD	323/336
VK3QI	323/332
VK3AKK	323/331
VK6RU	322/373
VK5XN	322/338
VK4RF	322/337
VK3DYL	322/323
VK2FGI	319/320
VK3OT	318/327
VK4OH	318/320
VK5EE	317/318
VK6NE	316/328
VK3CSR	316/320
VK1ZL	316/317
VK3AMK	314/329

General Listing

VK6AJW	312/315
VK3YJ	312/314
VK4VC	308/324
VK5WV	305/322
VK3RF	305/311
VK3AWY	305/310
VK3WJ	305/308
VK7BC	303/309
VK2WU	294/296
VK4UA	293/308
VK4PX	292/312
VK6PY	292/294
VK2AKP	291/294
VK4UC	290/306
VK2DTH	288/289
VK2APK	287/313
VK6RO	287/289
VK4BG	286/299
VK7AE	285/291
VK3CYL	284/290
VK3DU	284/290
VK5OU	283/286
VK3VU	272/275
VK4DP	271/280
VK3JI	266/279
VK6VS	258/259
VK2SG	254/274
VK3VQ	254/269
VK3GI	254/256
VK2AVZ	253/257
VK4QO	253/255
VK2ETM	240/
P57AB	236/237
VK2PU	232/233
VK2BCH	224/226
VK2CKW	224/225
VK4OX	220/222
VK5BO	220/222
VK3DP	220/221
VK5IE	220/221
VK6YF	212/213
VK1PS	211/212
VK2VBL	208/209
VK2VFT	203/205
ON6DP	202/
VK4KRP	200/201
VK6BQN	187/190
KA1TFU	177/178
VK3DD	175/176
VK2BQS	162/163
VK3DVT	160/161
7J1AAL	150/
VK3DNC	142/
VK6LC	139/
VK4VJ	136/137
SM6PRX	125/126
VK7YP	123/124
VK7WD	116/
VK3BRZ	115/116
VK4NJQ	111/115
VK4ARB	111/
VK4LV	108/110
VK5GZ	108/109
VK5AGM	106/107
VK4EJ	105/106
N4JED	105/
VK3EHP	104/105
VK4VIS	104/105
VK4BJE	103/104
VK3YH	103/
VK4DMP	102/
VK5ZH	101/104
VK2CMV	101/102
VK4KGE	100/101
VK3TI	099/101
VK3PTB	099/100

WIA DXCC STANDINGS — CW

Honour Roll

CALLSIGN	COUNTRIES
VK3QI	319/326
VK6HD	314/331

General Listing

VK2QL	313/359
VK3XB	313/343
VK3YL	304/340
VK4RF	304/328
VK3KS	299/322
VK6RU	275/317
VK2APK	275/304
VK5WO	267/268
VK3AKK	263/265
VK3JI	242/265
VK7BC	212/219
VK3DP	211/212
VK4DA	208/209
VK2CWS	204/205
VK4LV	184/190
VK6PY	179/181
VK4DP	178/188
VK4UC	170/178
VK5BO	160/184
VK5GZ	151/152
VK3DNC	147/148
VK4UA	143/177
EA6AAK	138/
VK7DQ	138/
VK2SG	137/148
VK6ASO	132/133
VK4KS	127/139
VK2TB	124/125
VK3AGW	120/
VK2AKP	116/117
VK5QJ	108/109
VK4FB	105/106
VK4PX	104/112
DK9EA	100/

WIA DXCC STANDINGS—OPEN

Honour Roll

CALLSIGN	COUNTRIES
VK4KS	323/365
VK5WO	323/354
VK6HD	323/336
VK3QI	323/333
VK3AKK	323/331
VK6RU	322/373
VK4RF	322/354
VK3YL	321/363
VK3OT	321/330
VK3JA	314/359
VK3AMK	314/329

General Listing

VK7BC	313/318
WA3HUP	308/330
VK3XB	303/340
VK4PX	299/323
VK4UA	296/310
VK2APK	294/328
VK4BG	293/309
VK6PY	293/297
VK4UC	292/310
VK2AKP	291/294
VK2SG	290/314
VK6RO	288/290
VK3JI	287/311
VK3CYL	284/290
VK4DP	279/287
VK3DP	278/279
VK3VQ	269/284
VK5BO	266/301
VK4DA	209/210
VK3DNC	181/182
PR7CPK	175/
VK2BQS	172/173
VK5GZ	164/165
VK6LC	142/143
VK6ASO	137/138
VK4NJQ	134/139
VK6NV	127/128
VK4EZ	123/131
VK2AMV	120/126
VE7RD	107/
VK3COR	103/104
VK7TS	102/
SM7WF	101/
VK7DS	100/102
VK2KE	100/
VK5ZN	100/

WIA DXCC STANDINGS—RTTY

CALLSIGN	COUNTRIES
VK3EBP	169/170
VK2SG	159/160
VK2BQS	109/110
VK5RY	101/102

ar

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

STOLEN EQUIPMENT REGISTER

The Stolen Equipment Register is one of many services offered to members by the WIA. It has been in operation since 1980, and is maintained on a computer database in the Federal Office.

Members wanting to take advantage of the Register, either to publicise the theft of their equipment, or to check equipment they are about to purchase, may write, fax, or telephone the Federal Office.

Any telephone reports of stolen equipment MUST be followed by written confirmation of the details.

For maximum efficiency, these details should include Manufacturer's name, model, type of equipment, serial number, date stolen, owner's name, address and callsign, any distinguishing features or modifications and the police contact (if any).

When equipment is recovered it is important that you advise the Federal Office as soon as practicable.

The following list is the most up-to-date information available at the time of going to press, but is based entirely on information received from you, the member. Would all members please check this list and immediately advise if there are any amendments.

Only those items stolen in the past five years are included in this list.

MANUFACTURER	MODEL	DESCRIPTION	SERIAL NUMBER	OWNER	DATE STOLEN	COMMENT
AEA	PAKRATT	MULTIMODE TNC	19092	VK3XBE	28.07.91	
ALINCO	ALD24T	2M/70CM MOBILE RIG	10107310	VK2TPH	21.01.91	DIPLEXER FITTED 2 ANTENNA CABLES
AMSTRAD	PC700	LAPTOP COMPUTER	532-872380	VK5ALE	16.04.92	ENGRAVED LEPARC OR VK5ALE
BELCON	LS-202E	2M M/MODE H/HELD	401992	VK3YYD	07.11.90	
BWD	804	DC-10MHZ SCOPE	51767	VK2ZQW	11.01.90	-
CHIRNSIDE		5 MOB HF ANTENNAS	VK3AMM	26.03.92		
COMMODORE	1541 II	DISK DRIVE		VK5ALE	03.04.91	ENGRAVED L.E.P.A.R.C.
	64	COMPUTER	VK5ALE		03.04.91	ENGRAVED L.E.P.A.R.C.
DAIWA	2M 70 CM	CROSSNEEDLE SWR MTR		VK3XBE	28.07.91	
	CN-620A	SWR/POWER METER	-	VK2DQP	16.09.91	
	CNW-419	ANTENNA TUNER		VK3XBE	28.07.91	
DICK SMITH		2M 5/8 MOBILE WHIP		VK3AMM	26.03.92	
	T-2000	SOLDERING STATION	-	VK2DQP	16.09.91	
DRAKE	TR-7	HF TRANSCEIVER	2333	VK2AML	16.05.90	OWNERS NAMES ENGRAVED
DSE	COMMANDER	2M FM TRANSCEIVER		VK2ZOD 3YOS	12.06.92	REAR PANEL ENGRAVED MIC SOC CHGD
EMTRONICS		NOISE BRIDGE	EM342	VK4AAE	27.10.89	-
FDK	MULTI 7	2M TRANSCEIVER		VK5XY	06.03.92	ENGRAVED D/LICENCE S 415 265 O
GCOL	GV-16	2 M FM HANDHELD		VK3JDO	17.11.89	WITH ANTENNA
GME	TX472S	40 CH UHF T/CEIVER	912 48058	VK3KLF	14.06.90	-
	TX830	40 CH AM CB	8770556	VK4IS	15.08.90	-
GOODWILL	GFC8055F	DIGITAL FREQ COUNTER	2020452	VK2IT	07.08.91	
HOME BREW	-	ANTENNA TUNING UNIT	-	VK2DQP	16.09.91	
	-	ELECTRON MORSE KEYER	-	VK2DQP	16.09.91	
HOMEBREW		6M 60W LINEAR AMP		VK3AMM	26.03.92	
ICOM	2410H	MOBILE RADIO	2668	STEWART ELEC	25.04.92	
	2SAT	HAND HELD	1387	STEWART ELEC	25.04.92	
	2SRA	HAND HELD	3299	STEWART ELEC	25.04.92	
	701	HF TRANSCEIVER	02318	VK5ALE	16.04.92	ENGRAVED LEPARC OR VK5ALE
	735	MULTI-MODE HF RADIO	38065	STEWART ELEC	25.04.92	
	HM4G	SPEAKER MIC	-	VK5ZGB	16.12.89	-
	IC02A	2 M FM HANDHELD	29906249	VK5ZGB	16.12.89	-
	IC02A	2M FM HANDHELD	23186	VK2FZH	09.06.89	WITH BP3 AND BC25E
	IC02AT	2 M HAND HELD	406070630	VK2OG	08.10.91	
	IC044	70 CM FM HANDHELD	-	VK5ZGB	16.12.89	-
	IC127IA		001398	VK3XBE	28.07.91	
	IC211	2 M TRANSCEIVER	-	VK2IT	07.08.91	WITH MICROPHONE
	IC22	2M FM TRANSCEIVER	12467	VKITR	06.02.90	NO POWER PLUG/DIAL LAMP UNUSUAL
	IC22	2M FM TRANSCEIVER	10918	VK3XD	08.02.90	-
	IC22S	2M FM TRANSCEIVER	15674	VK2CIB	11.02.89	-
	IC22S	2M FM TRANSCEIVER	11912	VK2ETJ	06.03.88	PRE-AMP, SOCKET
	IC255A	VHF TRANSCEIVER	10308425	VK3KLF	14.06.90	-
	IC271A	2M ALL MODE TRCVER	27402603	VK3XBE	28.07.91	
	IC280	TRANSCEIVER	02592	VK2BVW	30.03.88	-
	IC290A	ALL MODE TRANSCEIVER	001532	VK3YFA	01.11.90	-
	IC2A	2M FM HANDHELD	12213837	VK5ABY	22.12.88	-
	IC2GAT	2M FM HANDHELD	08616	VK3JDO	17.11.89	WITH BP70, BC36, BPSA X 2
	IC471A	70 CM TRANSCEIVER	20801900	VK3XBE	28.07.91	
	IC560	6M TRANSCEIVER	01153	VK3MT	01.02.90	ENGRAVED SECURITY NO. T-00510
	IC560	6 M TRANSCEIVER	02057	VK2IT	07.08.91	WITH MICROPHONE
	IC701	HF TRANSCEIVER	8001039	VK2???	15.02.88	-
	IC701PS	POWER SUPPLY	7800978	VK2???	15.02.88	-
	IC721	HF TRANSCEIVER	003663	A. WOINAR	02.07.90	TRANSCEIVES ALL RFDS FREQUENCIES
	IC730	HF TRANSCEIVER	13814689	VK3MT VK3COT	05.11.92	DC POWER CORD NOT TAKEN
	IC735	HF TRANSCEIVER	-06196	RMIT	06.12.92	ENGRAVED HEATSINK & TOP COVER
	IC735	HF TRANSCEIVER	020254	VK2AZI	16.12.92	INC MOUNTING BRACKET/MICROPHONE
	IC735 PSU	POWER SUPPLY	-0180	RMIT	06.12.92	
	IC745	HF TRANSCEIVER		VK3XBE	28.07.91	
	ICR70	COMMS RECEIVER	18503539	VK3XBE	28.07.91	
	ICR7000	COMMS RECEIVER	002670	VK3XBE	28.07.91	
	P2AT	HAND HELD	1817	STEWART ELEC	25.04.92	
	PS30	POWER SUPPLY	20302017	VK3XBE	28.07.91	
	R1	WIDE BAND RECEIVER	64395	STEWART ELEC	25.04.92	
	SM6	DESK MICROPHONE	20507750	VK3XBE	28.07.91	
	W2A	DUAL BAND HAND HELD	1866	STEWART ELEC	25.04.92	

MANUFACTURER	MODEL	DESCRIPTION	SERIAL NUMBER	OWNER	DATE STOLEN	COMMENT
KDK	2025 MK II	2M TRANSCEIVER		VK2ETJ	06.03.88	DEFUNCT FINAL
	FM2025 MK 2	2M FM TRANSCEIVER	A5020	VK2AML	03.07.88	SHARPE MICROPHONE
	MULTI 7	2M HANDHELD		VK2TJB	09.02.88	DRIVERS LICENCE NO. ENGRAVED
KENWOOD	309 VFO	VFO TO SUIT TR7200G	440168	VK5ALE	03.04.91	
	DM81	GRID DIP OSCILLATOR	4020163	VK2KLF	10.08.89	STENCILLED IN 20MM BRIGHT YELLOW
	LF-30A	LOW PASS FILTER	-	VK2ADP	16.09.91	
	MC 50	MICROPHONE	-	VK2DQP	16.09.91	
	MC-50	DESK MICROPHONE	N/A	VK5ABY	22.12.88	-
	MS1	MOBILE MOUNT	-	VK5BJA	30.05.89	-
	PS430	POWER SUPPLY		VK3CLV	16.12.91	
	SMC/3C	H/HELD MIC & SPEAKER	-	VK2PRK	25.07.91	
	TH75A	VHF/UHF HAND HELD	0061315	VK6KCH	26.02.92	CASE - SPKR/MIC - MOB POWER LEAD
	TM201B	VHF TRANSCEIVER	7011611E	VK3CLV	16.12.91	
	TM221A	2M FM TRANSCEIVER	8110722	VK2CCD	09.04.88	-
	TM221A	2M FM TRANSCEIVER	8022583	VK3KGM	04.11.92	
	TM231A	2M FM TRANSCEIVER	0051016	VK4IS	27.07.90	-
	TM441A	432 MHZ FM TRANSC	6010370	VK4IS	27.07.90	-
	TR2600A	2M HANDHELD TCVER	5060934	VK2KLF	10.08.89	MISSING HAND STRAP
	TR2600A	2M HANDHELD	5060895	VK5BJA	30.05.89	INCLUDING RUBBER DUCK ANTENNA
	TR7200G	2M TRANSCEIVER	111048	VK5ALE	03.04.91	
	TR751A	144 MHZ TRANSCEIVER	7050702	VK3HY	23.04.92	NO IDENTIFICATION
	TR751A	2M ALL MODE T/CEIVER	7050512	VK3KMJ	25.02.90	GREY MIC - DCL MODEM BOARD
	TR7850	2M FM H/HELD T/CEIVR M	2020561	VK2ALK	22.10.88	-
	TS120S	HF TRANSCEIVER	0010035	VK2EV	05.06.92	WITH MIKE AND 12V POWER LEAD
	TS120S	HF TRANSCEIVER	0070741	VK5AKN	12.05.92	ENGRAVED WITH DRIVERS LICENCE NO
	TS130S	HF TRANSCEIVER	4040IC8	VK2BVW	30.03.88	-
	TS130S	HF SSB TRANSCEIVER	1090168	VK5ABY	22.12.88	-
	TS440S	HF TRANSCEIVER	7090271	VK2FIT	24.10.89	WITH PS50 PSU & MC85 DESK MIC
	TS440S		7031310	VK6ID	25.08.91	
	TS440S	HF TRANSCEIVER	R 7060309	VK3CLV	16.12.91	SP40 SP50 EXTERNAL SPEAKERS
	TS440S	HF TRANSCEIVER	9100338	VK6ELL	01.02.92	
	TS440S	HF TRANSCEIVER	0060078	VK2FIT	01.07.90	-
	TS440S	HF TRANSCEIVER	0101192	VK3NRG	14.10.90	STOLEN FROM VEHICLE IN PERTH
	TS520	HF TRANSCEIVER	010296	VK2ZQW	11.01.90	-
	TS520S	HF TRANSCEIVER	?	VK2FZH	09.06.89	STICKER FROM 'TURKEY RADIO'
	TS520SE	HF TRANSCEIVER	8650	VK5ALE	03.04.91	
	TS670	6M & HF TRANSCEIVER	?	VK2ZXC	28.06.90	-
	TV506	6M CONVERTER	720089	VK2ZQW	11.01.90	-
KING AIR	AIRCRAFT BAN	TRANSCEIVER		VK6ID	25.08.91	
KYOKUTO	FM144	VHF FM TRANSCEIVER	8296	VK2ZQW	11.01.90	-
M/WAVE MODULE	MML-432-50	70 CM 50W AMPLIFIER		VK3XBE	28.07.91	
MICROMETER		SWR METER	NOT KNOWN	VK5ALE	16.04.92	ENGRAVED LEPARC OR VK5ALE
MICROWAVE	40W-144 MHZ	2M LINEAR AMPLIFIER	-	VK2ZQW	11.01.90	-
MIRAGE		2M 150W AMPLIFIER		VK3XBE	28.07.91	
		2M 60W AMPLIFIER		VK3XBE	28.07.91	
PAC-COMM	TINY 2	TNC	T5782	GOULBURN ARC	27.11.92	
	TINY 2	TNC	T6784	GOULBURN ARC	27.11.92	
PACCOM	DR200	DUAL PORT TNC	2231	VK2RDX	27.05.91	RELAY IN BOX IN DC SUPPLY LINE
PACCOMM	TINY 2	TNC	T5359	VK5ALE	03.04.91	WITH MANUAL
PHILIPS	1680	VHF MOBILE T/CEIVER		VK5XY	06.03.92	ENGRAVED D/LICENCE S 415 265 O
	323	UHF CB HANDHELD		VK6ID	25.08.91	OFF 1 AND 20
	FM321	70CM FM TRANSCEIVER	156	VK2IT	07.08.91	WITH MICROPHONE
	PRM80	VHF TRANSCEIVER	NOT KNOWN	VH3HY	23.04.92	4 COMM 3 X 144 MHZ RPTR CHANNELS
	SXA	UHF CB HANDHELD		VK6ID	25.08.91	2 OFF CH 17 AND 20
PHILLIPS	828	2M FM TRANSCEIVER	44982	VK4IS	15.08.90	10 CHANNELS - 3 FITTED
	FM828	VHF TRANSCEIVER		VK5ALE	03.04.91	1 CHANNEL 147.575
	FM828	FM TRANSCEIVER	45459	GOULBURN ARC	27.11.92	
REALISTIC		SCANNING RECEIVER		VK6ID	25.08.91	BNC SOCKET
SAWTRON	999	UHF CB TRANSCEIVER	203026	VK2KSN	24.04.92	
SONY	2001D	COMMUNICATIONS RECVR	?	VK2FZH	09.06.89	BROKEN ANTENNA
STANDARD	C146A	2M TRANSCEIVER		VK3XCE	05.10.92	XTALS FITTED RPT 6700-7000-6500
	C520	2M & 70 CM HANDHELD	F140829	ANDREWS COMM	18.02.90	STOLEN AT GOSFORD FIELD DAY
	C528	2M HAND HELD	OOE 130667	VK2PD	27.08.92	MANUAL TAKEN BUT NOT RUBBER DUCK
	C528	2M HAND HELD	OOEI50667	VK2PD	27.08.92	MANUAL ALSO
	CAT08	MIC/SPEAKER		VK3XCE	05.10.92	
	CMP08	RUBBER DUCK ANTENNA		VK3XCE	05.10.92	
STC	MT36	SWR BRIDGE		VK2RDX	27.05.91	
	MTR25 191B	VHF TRANSCEIVER		VK2RDX	27.05.91	CTCSS AND TIMER UNITS FITTED
	MTR25 191D	UHF TRANSCEIVER		VK2RDX	27.05.91	CTCSS AND TIMER UNITS FITTED
SWAN	MB40	40 M MOBILE T/CEIVER	16471	VK2IT	07.08.91	
TELEQUIP'T	551	OSCILLOSCOPE		VK4AAE	27.10.89	
TONO	THETA 550	KEYBOARD TERMINAL	821485	VK3XBE	28.07.91	
UNIDEN	PC122	SSB/AM CB TRANSCEIVR	NOT KNOWN	VK3HY	23.04.92	PHILIPS MICROPHONE
VIBROPLEX	-	MORSE KEY	-	VK2DQP	16.09.91	
WELZ		SWR/POWER METER		VK2AZI	16.12.92	
YAESU	FC 700	A T U	4J090473	VK5ALE	16.04.92	ENGRAVED LEPARC OR VK5ALE
	FC707	ANTENNA TUNER	1L170086	VK2CFC	06.09.91	
	FC707	ANTENNA TUNER	1N180265	VK4AAE	27.10.89	
	FL2010	2M LINEAR AMPLIFIER	1L031300	VK3DKO	25.08.88	MOUNTED IN CRADLE
	FP700	POWER SUPPLY	3C-020584	VK4BWG	11.03.92	
	FP707	POWER SUPPLY	1L150596	VK2CFC	06.09.91	
	FP707	12V 20 AMP P/SUPPLY	1H120548	VK5ABY	22.12.88	

MANUFACTURER	MODEL	DESCRIPTION	SERIAL NUMBER	OWNER	DATE STOLEN	COMMENT
	FP707	POWER SUPPLY	4C050487	VK4AAE	27.10.89	-
	FRG7	HF RECEIVER	8HH210862	VK2IT	07.08.91	
	FRG7700	RECEIVER	3M260983	VK2XPU	01.08.89	-
	FRG9600	SCANNING RECEIVER	5 N 120767	DICK SMITH	01.11.91	STOLEN FROM BENDIGO VIC STORE
	FT-280R	2M TRANSCEIVER	2F22898	VK3XCE	05.10.92	
	FT101B	HF TRANSCEIVER	320376	VK2IT	07.08.91	WITH DESK MICROPHONE
	FT101E	HF TRANSCEIVER	8J361432	VK2DQP	16.09.91	
	FT101E	HF TRANSCEIVER	7K/301042	VK5EZ	08.07.89	-
	FT102	HF TRANSCEIVER	3K090835	VK2FLM	23.12.90	ENGRAVED NO B62075 YM-36 MIC
	FT207R	2M HANDHELD	1D132704	VK2ETJ	06.03.88	-
	FT208R	2M FM HANDHELD	4E382078	VK2PJ	29.03.89	FAULTY VCO
	FT208R	2M HANDHELD TRCVR		VK3XBE	28.07.91	
	FT209RH	2M FM HANDHELD	6E-260229	VK4BWG	11.03.92	FNB4 & FBA10 BATTERY PACKS
	FT211RH	2 M MOBILE TX	8M180306	VK2UP	09.07.92	FROM MOTEL HURSTVILLE
	FT212RH	2 M TRANSCEIVER	IC630020	VK2XMM	01.07.91	
	FT23R	2M FM HANDHELD	O0071763	DSE BOX HILL	18.09.91	
	FT2700RH	VHF/UHF TRANSCEIVER	5L121354	VK2AGB	28.05.92	
	FT290R	2M FM TRANSCEIVER	5G450016	VK7HW	18.04.88	MOBILE BRACKET
	FT290R	2M FM TRANSCEIVER	2D100942	VK3DKO	25.08.88	CALLSIGN ENGRAVED
	FT290R	2M FM TRANSCEIVER	SF 280702	VK4AAE	27.10.89	COMPLETE WITH NICADS
	FT290RII	2M FM TRANSCEIVER	8G130128	VK3YNB	04.06.92	WITH BATTERY BOX
	FT470	DUAL BAND HAND HELD	9L150788	DICK SMITH	31.08.90	STOLEN FROM BOURKE ST MELB STORE
	FT4700RH	VHF/UHF TRANSCEIVER	9C212240	VK3EMJ	16.07.91	NO MICROPHONE OR POWER LEAD
	FT7	HF TRANSCEIVER	8K110846	VK2IV	04.11.88	DIAL ILLUMINATION MODIFICATION
	FT7	HF TRANSCEIVER		VK5XY	06.03.92	ENGRAVED D/LICENCE S 415 265 O
	FT7	HF TRANSCEIVER	-	VK2PRK	25.07.91	ID 'NSW 718610' ENGRAVED ON BACK
	FT707	HF TRANSCEIVER	0G030440	VK3AMM	26.03.92	
	FT707	HF TRANSCEIVER	-	VK4AAE	27.10.89	-
	FT708R	70CMS FM HANDHELD	2J181463	VK2PJ	29.03.89	-
	FT712	UHF TRANSCEIVER	8I120576	GOULBURN ARC	27.11.92	
	FT757	HF TRANSCEIVER	4E-071058	VK4BWG	11.03.92	
	FT757GX	HF TRANSCEIVER	4J121785	VK2CFC	06.09.91	RF AMP NOISY - REQUIRES SERVICE
	FT757GX II	HF TRANSCEIVER	IL590102	DICK SMITH E	13.05.92	STOLEN FROM PARRAMATTA STORE
	FTV707	6M TRANSVERTER	IH010331	VK3AMM	26.03.92	
	FV707DM	EXTERNAL DIGITAL VFO	0L060097	VK4AAE	27.10.89	-
	SP4	EXTENSION		VK2AZI	16.12.92	
	YC355D	200MHZ FREQ COUNTER		VK2ZQW	11.01.90	-
	YM24A	MIC/SPEAKER		VK3XCE	05.10.92	
	YP150	DUMMY LOAD/PWR METER		VK3XBE	28.07.91	

ar

WIA ACCREDITED EXAMINERS

(Listed in Postcode order)

Below is a list of examiners accredited by WIA Exam Service to conduct radio examinations using WIA Exam Service examination materials.

The list is published in postcode order to assist candidates to determine the examiner closest to their location. This list was up-to-date as at 8 January 1993, but more applications to become an accredited examiner are still being received.

Accredited examiners will not only be able to provide advice and assistance in relation to examinations, but also about "how to become a radio amateur", to all interested enquirers in their locality. The DoTC and WIA Exam Service direct all such enquiries to accredited examiners in the area in which the enquirer lives.

Jim Jones VK5JF	Darwin Amateur Radio Club Inc	GPO Box 3583, Darwin,	0801. Tel 089 46 6119 (BH)
Barrie Burns VK8DI	Darwin Amateur Radio Club Inc	1 Kerin Pl, Rapid Creek,	0810. Tel 089 85 1068 (AH)
Spud Murphy VK8ZWM	Darwin Amateur Radio Club Inc	139 Lee Pt Rd, Wagaman,	0810. Tel 089 46 5887 (BH)
Trevor Connell VK8CO	Darwin Amateur Radio Club Inc	PO Box 40441, Casuarina,	0811. Tel 089 45 3373 (AH)
Jeff Farmer VK8GF	Alice Springs ARC	PO Box 2953, Alice Springs,	0871. Tel 089 52 2388 (BH)
Graham Heller VK8GR	Alice Springs ARC	PO Box 2953, Alice Springs,	0871. Tel 089 52 4536
Terry Murphy VK8TM	Alice Springs ARC	PO Box 2953, Alice Springs,	0871. Tel 089 55 0758
Richard Hand VK8AZ	Gove Amateur Radio Group	PO Box 211, Nhulunbuy,	0881. Tel 089 87 3148 (AH)
Grant Hinchcliffe VK2GIX	WARS Examinations	72 Vine St, Chippendale,	2008. Tel 02 319 1913 (AH)
Eric Van De Weyer VK2KUR	WARS Examinations	PO Box 131, Watsons Bay,	2030. Tel 02 318 6138 (BH)
Rick Cummins VK2QU	WARS Examinations	1493 Anzac Pde, Little Bay,	2036. Tel 02 661 3816 (AH)
George Voron VK2BGV	International ARC	2 Griffith Avenue, Roseville,	2069. Tel 02 417 1066
Sam Voron VK2BVS	International ARC	2 Griffith Avenue, Roseville,	2069. Tel 02 417 1066
David Bloodworth VK2KQV	Hornsby Amateur Radio Club	24 Wambool St, Turramurra,	2074. Tel 02 44 4080 (AH)
Graham Sommer VK2DWL	Hornsby Amateur Radio Club	PO Box 362, Hornsby,	2077. Tel 02 875 2273 (AH)
Tony Williams VK2DJW	Hornsby Amateur Radio Club	PO Box 362, Hornsby,	2077. Tel 02 489 3312 (AH)
Wally Jones VK2GTO		26 Donald St, Carlingford,	2118. Tel 02 871 5190 (AH)
Barry Gammage VK2GAM	WIA NSW Division	PO Box 1066, Parramatta,	2124. Tel 02 727 7338
Cec Purvis L20997	WIA NSW Division	PO Box 1066, Parramatta,	2124. Tel 02 649 9234
Terry Ryeland VK2UX	WIA NSW Division	PO Box 1066, Parramatta,	2124. Tel 02 689 2417 (BH)
Jim Goodger VK2JO		2 Fullam Rd, Blacktown,	2148. Tel 02 622 6268
James Rodgers VK2DXM	ROADS	119 Showground Rd, Castle Hill,	2154. Tel 02 680 1404 (BH)
Bob Girdo VK2RG		13 Iris St, Sefton,	2162. Tel 02 743 7555 (AH)
Miles Burkitt VK2GOJ	Miles Communications P/L	1 Conrad St, Wetherill Park,	2164. Tel 02 727 7338 (AH)
Hoss Bernhard VK2ICE	Fishers Ghost ARC	PO Box 34, Catherine Field,	2171. Tel 046 28 3839 (AH)
Wayne Brack VK2WDL	Bankstown Amateur Radio Club	54 Hillard St, Wiley Park,	2195. Tel 02 743 8417 (BH)
Stewart McCarthy VK2MX	St George ARS Inc	PO Box 530, Engadine,	2233. Tel 02 520 8662 (AH)
Barry McNeil VK2FP	Sydney Amateur Television Gp	3 Bella Vista St, Heathcote,	2233. Tel 02 520 2867 (BH)

Paul Smith VK2ZSA	St George ARS Inc	PO Box 530, Engadine,	2233. Tel 02 520 7323 (AH)
Tom Thornton VK2CJT	St George ARS Inc	PO Box 530, Engadine,	2233. Tel 02 520 5843
Ean Young VK2FSO	St George ARS Inc	PO Box 530, Engadine,	2233. Tel 02 580 5329 (AH)
Leon Brett VK2BLV	Central Coast ARC Inc	87 Albany St, East Gosford,	2250. Tel 043 24 1649
Bill Scovell VK2FKE	Central Coast ARC Inc	13 Tulani Ave, Daleys Point,	2257. Tel 043 43 2339
Greg Jackson VK2GWJ		26 Harding Ave, Lake Munmorah,	2259. Tel 043 58 8479 (AH)
Peter King VK2GPK	Southlakes Computers	6 Macnamir Close, Morisset,	2264. Tel 049 73 3688 (AH)
Jim Wing VK2MSB		10 Victory Street, Cooranbong,	2265. Tel 049 77 1507 (AH)
Peter Browne VK2GFE		PO Box 77, Warners Bay,	2282. Tel 049 58 2832 (AH)
Maurice Jones VK2CD		PO Box 77, Warners Bay,	2282. Tel 049 49 8786
Fred Lawler VK2SI	Westlakes Amateur Radio Club	PO Box 77, Warners Bay,	2282. Tel 049 64 8018 (BH)
Paul Lorentzen VK2ATR	Westlakes Amateur Radio Club	PO Box 77, Warners Bay,	2282. Tel 049 59 1788 (BH)
Greg Smith VK2GJS	Westlakes Amateur Radio Club	PO Box 77, Warners Bay,	2282. Tel 049 41 3468 (BH)
Dave Myers VK2DFL	Wicen (NSW) Inc	61 Fern St, Arcadia Vale,	2283. Tel 049 75 1136
Frederick Eade VK2AEE	Frederick William Eade	276 Park Ave, Kotara,	2289. Tel 049 57 5131
George Hombsch VK2FCC	Tamworth Radio Club Inc	PO Box 4, Tamworth,	2340. Tel 067 65 9351 (BH)
Neville Pratt VK2FNP	Tamworth Radio Club Inc	PO Box 4, Tamworth,	2340. Tel 067 65 4099
Allan Walker VK2ZJW	Tamworth Radio Club Inc	PO Box 4, Tamworth,	2340. Tel 067 64 1878
Val Birks VK2TB	Armidale & District ARC	Lot 79 Invergowrie Rd, MSF 2002 Armidale,	2350. Tel 067 75 2224
Roger Chubb VK2FGE	Armidale & District ARC	21 Tuncredi St, Armidale,	2350. Tel 067 72 7840 (AH)
Shane Rae VK2XRR		73 Cowper St, Wee Waa,	2388. Tel 067 95 3075 (AH)
Brent Paull VK2ZOO		18 Boundary St, Narrabri,	2390. Tel 067 92 3386 (AH)
Kevin Dockrill VK2GVE		12 Warrina Cres, Moree,	2400. Tel 067 52 4699 (AH)
Brian Steel		309 Chester St, Moree,	2400. Tel 067 52 1472
Niel Cunningham VK2RD	Oxley Amateur Radio Club	259 Hastings River Dve, Port Macquarie,	2444. Tel 065 83 6380
Keith Hanlon	Oxley Region ARC	PO Box 712, Port Macquarie,	2444. Tel
Larry Lindsay VK2CLL	Oxley Region ARC	PO Box 712, Port Macquarie,	2444. Tel 065 87 1155 (AH)
Geoff Stephenson VK2BTU	Oxley Region ARC	Lot 3 Burrawan Dve, Wauchope,	2446. Tel 065 85 3991
Bob Colsell VK2AWA	Coffs Harbour & District ARC	PO Box 655, Coffs Harbour,	2450. Tel 066 52 6135
Peter McAdam VK2EVB	Coffs Harbour & District ARC	PO Box 655, Coffs Harbour,	2450. Tel 066 52 7160
Hans Schumacher VK2DGV	Coffs Harbour & District ARC	PO Box 655, Coffs Harbour,	2450. Tel 066 51 2020 (AH)
John Williams VK2BUI	Coffs Harbour & District ARC	PO Box 655, Coffs Harbour,	2450. Tel 066 53 8313
Gerry Cresswell VK2IGC	Summerland Amateur Radio Club	PO Box 524, Lismore,	2480. Tel 066 63 1410 (AH)
Ken Hore VK2HE	Summerland Amateur Radio Club	PO Box 524, Lismore,	2480. Tel 066 21 8242 (BH)
Leith Martin VK2EA	Summerland Amateur Radio Club	PO Box 524, Lismore,	2480. Tel 066 24 2550 (AH)
Peter Richens VK2FSD	Summerland Amateur Radio Club	PO Box 91, Lismore Heights,	2480. Tel 066 24 3211 (BH)
John Toland VK2XKX	Summerland Amateur Radio Club	101 College St, Lismore,	2480. Tel 066 21 2933 (AH)
Rick Virtue VK2EJV	Summerland Amateur Radio Club	90-92 James St, Dunoon,	2480. Tel 066 89 5137 (BH)
James Glenn VK2AIQ		24 Tweed Broadwater Vill, Tweed Heads South,	2486. Tel 075 24 9772
Errol Chittick VK2EGC	Tweed Valley ARC	C/- 9 Grevillia Ave, Bogangar,	2488. Tel 066 72 3237 (AH)
Phil Evans VK2KEV	Tweed Valley ARC	C/- 9 Grevillia Ave, Bogangar,	2488. Tel 066 76 1671 (AH)
LLoyd Martin VK2BYU	Tweed Valley ARC	C/- 9 Grevillia Ave, Bogangar,	2488. Tel
Graham Denney VK2GID	Illawarra ARS Inc	2/2A Macquarie St, Wollongong,	2500. Tel 042 29 4170
Jim Hayes VK2EJH		1 Kathleen Cres, Woonona,	2517. Tel 042 84 9317 (AH)
Barry Sullivan VK2BZ		20 Narelle Cres, Woonona,	2517. Tel 042 85 2223 (AH)
Ken Goodhew VK2TKE		3 Hendricks Pde, Mt Warrigal,	2528. Tel 042 97 3037 (AH)
Darrel Nelson VK2USA	Illawarra ARS Inc	PO Box 341, Dapto,	2530. Tel 042 61 8636
Jennifer Cox		41 King George St, Callala Beach,	2540. Tel 044 46 5728 (AH)
Peter Madden VK2XXS		30 Catherine St, Myola,	2540. Tel 044 46 5196
David Blunn VK2DDJ	Shoalhaven Amateur Radio Club	PO Box 230, Nowra,	2541. Tel 044 64 1056
John Bogdanski VK2FEX	Shoalhaven Amateur Radio Club	PO Box 230, Nowra,	2541. Tel 044 21 0670
James O'Brien VK2BHU	Far South Coast ARC	PO Box 46, Bega,	2550. Tel 064 94 1286
David Plumb VK2DRP	Far South Coast ARC	PO Box 686, Bega,	2550. Tel 064 92 2220
Ray Price VK2AWQ	Far South Coast ARC	26 Bay St, Tathra,	2550. Tel 064 94 1347
Robert Demkiw VK2ENU		18 Ettalong Place, Woodbine,	2560. Tel 046 26 4776 (AH)
David Medcalf VK2GDM	Fishers Ghost ARC	9 Buffalo Way, Campbelltown,	2560. Tel 046 27 1025
Les Simmons VK2TJ	Fishers Ghost ARC	8 Raymond Ave, Campbelltown,	2560. Tel 046 28 3839
Michael Turner VK2WMT	Bankstown Amateur Radio Club	PO Box 375, Ingleburn,	2565. Tel 02 334 0023 (BH)
Ian Jeffrey VK2AIJ	Goulburn Amateur Radio Soc	144 Kinghorne St, Goulburn,	2580. Tel 048 21 6806 (AH)
Tony King VK2FBD	Goulburn Amateur Radio Soc	RMB 247 Mayfield Rd, Tarago,	2580. Tel 048 49 4433 (AH)
Alex Thuma VK2ATY	Goulburn Amateur Radio Soc	26 William St, Goulburn,	2580. Tel 048 21 9256 (AH)
Mike Morrissey VK1RI		32 Lonsdale St, Braddon,	2601. Tel 06 248 9600 (BH)
Neil Pickford VK1KNP	WIA ACT Division	GPO Box 600, Canberra,	2601. Tel 06 274 8422 (BH)
Mal Cooper VK1MC		PO Box 652, Jamison,	2604. Tel 06 241 1073 (AH)
Christopher Davis VK1DO	WIA ACT Division	123 Hawkesbury Cres, Farrer,	2607. Tel 018 62 5027
Rob Apathy VK1KRA	WIA ACT Division	5 Wrixon St, Latham,	2615. Tel 06 254 2982
Barry Busch'l VK2GDV	Twin Cities R & E Club Inc	355 Wilson St, Albury,	2640. Tel
Terry Clark VK2ALG	Twin Cities R & E Club Inc	PO Box 396, Albury,	2640. Tel 060 25 3292
Vic Hearne VK3CQP	Twin Cities R & E Club Inc	PO Box 396, Albury,	2640. Tel
Alan James VK2FIZ	Twin Cities R & E Club Inc	PO Box 396, Albury,	2640. Tel 060 25 1117 (AH)
Greg Sargeant VK2EXA	Twin Cities R & E Club Inc	PO Box 396, Albury,	2640. Tel 060 21 5438 (AH)
Graeme Scott VK2KE	Twin Cities R & E Club Inc	PO Box 396, Albury,	2640. Tel 060 21 3655 (BH)
David Ashley VK2JDA	Wagga Amateur Radio Club Inc	PO Box 294, Wagga Wagga,	2650. Tel
Harley Davison VK2AHD	Wagga Amateur Radio Club Inc	18 Warrawong St, Wagga,	2650. Tel 069 21 1004 (AH)
John Eyles VK2BXD	Wagga Amateur Radio Club Inc	PO Box 294, Wagga Wagga,	2650. Tel 069 22 2363 (BH)
Mike McDonnell VK2DAI	Wagga Amateur Radio Club Inc	PO Box 294, Wagga Wagga,	2650. Tel
Sid Ward VK2SW	Wagga Amateur Radio Club Inc	PO Box 294, Wagga Wagga,	2650. Tel 069 22 6082
Peter Watson VK2APW	Wagga Amateur Radio Club Inc	PO Box 294, Wagga Wagga,	2650. Tel
Leon Boneham VK2DLN	Griffith ARC Inc	PO Box 1804, Griffith,	2680. Tel 069 62 4534 (BH)
Graeme Watkins VK2DGW	Griffith ARC Inc	PO Box 1016, Griffith,	2680. Tel 069 62 4577 (BH)
Pixie Chapple VK2KPC	St John Ambulance ARC	231 Shepherd St, St Marys,	2760. Tel 02 623 5663 (AH)
Brett Hazell VK2CBH	Chifley Amateur Radio Club	PO Box 280, Mt Druitt,	2770. Tel 02 671 2035 (AH)
Leon McHugh VK2FLI	Chifley Amateur Radio Club	PO Box 280, Mt Druitt,	2770. Tel 02 625 9646
Dave Pola VK2BDP	Chifley Amateur Radio Club	PO Box 280, Mt Druitt,	2770. Tel 02 628 9247 (AH)

Ralph Simmons VK2GRS	Chifley Amateur Radio Club	PO Box 280, Mt Druitt,	2770. Tel 02 671 4756
Alan Whitmore VK2YYJ		32 Greens Pde, Valley Heights,	2777. Tel 02 625 1388 (BH)
Adrian Clout VK2BFN		137 Lower Valley Rd, Hazelbrook,	2779. Tel 047 58 6797
Carl Palmer VK2BSD		176 Lower Valley Rd, Hazelbrook,	2779. Tel 047 58 6755 (AH)
Peter Van Gemert VK2ALL	Bathurst Amateur Radio Club	291 Durham St, Bathurst,	2795. Tel 063 31 2464
Neville Wilde VK2DR	Bathurst Amateur Radio Club	22 White St, Bathurst,	2795. Tel 063 31 5809 (AH)
Bruce Carroll VK2DEQ	Orange Amateur Radio Exams	PO Box 128, Orange,	2800. Tel 063 62 8703
Peter Carter VK2ETK	Orange Amateur Radio Exams	7 Ophir Rd, Orange,	2800. Tel 063 61 3439 (AH)
Vicki Marsden VK2EVM		Unit 11 'Woodlands', Hale St Orange,	2800. Tel 063 62 0087 (AH)
Ken Bird VK2GDK	Orana Amateur Radio Club	213 Alagalah St, Narromine,	2821. Tel 068 89 1308
Frank Wall VK2CWL	Orana Amateur Radio Club	'Westbrook', Narromine,	2821. Tel 068 89 0535
James Armytage VK2CJA	Orana Amateur Radio Club	'Kelburn', Gilgandra,	2827. Tel 068 48 1062
Bruce Chung VK2WWW	Orana Amateur Radio Club	26 Myrtle St, Gilgandra,	2827. Tel 068 47 2522
John Hams VK2JH	Orana Amateur Radio Club	Lot 28 Bencubbin Estate, Dubbo MS7,	2830. Tel 068 87 8241 (AH)
David Walters VK2AYO	Orana Amateur Radio Club	'Carramar' Burraway Rd, Dubbo MS4,	2830. Tel 068 88 5265
Brian Cooper VK2DHO	Parkes & District ARC Inc	C/- 4 William St, Parkes,	2870. Tel 068 62 2828
Tom Darcy VK2DDD	Parkes & District ARC Inc	4 William St, Parkes,	2870. Tel 068 62 1663 (AH)
Walter Field VK2NNF	Parkes & District ARC Inc	C/- 4 William St, Parkes,	2870. Tel 068 62 1776
Peter Hughes VK2MLG	Parkes & District ARC Inc	39 Orange St, Parkes,	2870. Tel 068 62 4217 (AH)
Dave Kent VK2BJI	Parkes & District ARC Inc	PO Box 564, Parkes,	2870. Tel 068 62 2154
Jan Burrell VK1BR	WIA ACT Division	20 Currey St, Gowrie,	2904. Tel
John Beverin VK3CMO	RMIT School of Electrotech	GPO Box 2476V, Melbourne,	3001. Tel 03 660 4455 (BH)
Graham Cottew VK3DPC	ARA Exam Service	GPO Box 628E, Melbourne,	3001. Tel 03 601 4203 (BH)
Neil Duncan VK3OK	ARA Exam Service	GPO Box 628E, Melbourne,	3001. Tel 03 601 4203 (BH)
Chris Edmondson VK3YID	ARA Exam Service	GPO Box 628E, Melbourne,	3001. Tel 03 601 4203 (BH)
Graham Judge VK3YGJ	ARA Exam Service	GPO Box 628E, Melbourne,	3001. Tel 03 601 4203 (BH)
Ralph Parkhurst VK3ZIP	ARA Exam Service	GPO Box 628E, Melbourne,	3001. Tel 03 601 4203 (BH)
Mike Ross VK3APW	ARA Exam Service	GPO Box 628E, Melbourne,	3001. Tel 03 601 4203 (BH)
Rob Whitmore VK3ESE	RMIT School of Electrotech	GPO Box 2476V, Melbourne,	3001. Tel 03 660 4479 (BH)
Peter Ormerod VK3CPO	RAAF Williams ARC	MCS No 1 Aircraft Depot, RAAF Williams Laverton,	3027. Tel 03 368 2266 (BH)
Bruce Kendall VK3WL	RAAF Williams ARC	8 Walwa Place, Werribee,	3030. Tel 03 741 7654 (AH)
Dixie Lee VK7HP	RAAF Williams ARC	5/24 Salisbury St, Werribee,	3030. Tel 03 742 3786
Brian Purcell VK3BQP		27 Kathleen St, Pascoe Vale South,	3044. Tel 03 386 7750
Howard Rider VK3ZJY		232 Cumberland Road, Pascoe Vale,	3044. Tel 03 306 8484
John Wright VK3AJL	J Wright & Associates	72 Ramsden St, Clifton Hill,	3068. Tel
Graham Gall VK3ZS		76 Greenwood Dve, Bundoora,	3083. Tel 03 467 2697
Chris McLaughlin VK3CHR		24 Collendina Cres, Greensborough,	3088. Tel 03 322 6104 (BH)
Ewen Templeton VK3BMV	NERG Exams	45 Cairns St, Greensborough,	3088. Tel 03 434 6071 (AH)
Greg Williams VK3VT	NERG Exams	1 Noorabil Crt, Greensborough,	3088. Tel 03 634 5532 (BH)
Harry Lodder VK3AXJ	Camberwell Grammar Radio Club	PO Box 151, Balwyn,	3103. Tel 03 836 6266 (BH)
Les Cardilini VK3BLC	RMIT School of Electrotech	56 Anderson St, Templestowe,	3106. Tel 03 846 1561 (AH)
Des Bird VK3EDB	Electrotechnology RMIT	8 Queen St, Surrey Hills,	3127. Tel 03 836 1837 (AH)
Philip Adams VK3JNI	Scout R & E Service Unit	PO Box 311, Box Hill,	3128. Tel 03 438 3013 (AH)
Len Atyeo VK3DXM	Scout R & E Service Unit	PO Box 311, Box Hill,	3128. Tel 03 848 3580
Craig Cook VK3CMC	RMIT School of Electrotech	33 Haig St, Box Hill South,	3128. Tel 03 890 2117 (AH)
Peter Fraser VK3ZPF	Scout R & E Service Unit	PO Box 311, Box Hill,	3128. Tel 03 895 9617 (AH)
Geoff Hudson VK3VR	NERG Exams	16 Fowler St, Box Hill Sth,	3128. Tel 03 888 8121 (AH)
Rob Carmichael VK3DTR		PO Box 200, Forest Hill,	3131. Tel
Jim Linton VK3PC		PO Box 200, Forest Hill,	3131. Tel
Geoff Atkinson VK3YFA	EMDRC	PO Box 87, Mitcham,	3132. Tel 03 791 7988 (BH)
Jack Bramham VK3WWW	EMDRC	PO Box 87, Mitcham,	3132. Tel 03 873 2459 (AH)
Joe Magee VK3BKI	EMDRC	PO Box 87, Mitcham,	3132. Tel 03 729 8579 (AH)
Dave Neville VK3UC	EMDRC	PO Box 87, Mitcham,	3132. Tel 03 802 7492 (AH)
David Nisbet VK3XDA	EMDRC	PO Box 87, Mitcham,	3132. Tel 03 420 2035 (BH)
Len Vermeulen VK3COD	EMDRC	PO Box 87, Mitcham,	3132. Tel 03 808 5350 (AH)
Neale McLennan VK3BOS	Healesville ARG Inc	42 Panfield Ave, Ringwood,	3134. Tel 03 870 4491 (BH)
Craig McMillan VK3CRA	VK3CRA Amateur Exams	5 Sunview Crt, Dingley,	3172. Tel 03 551 5635
Frank Robinson VK3DDK		PO Box 173, Prahran,	3181. Tel
Andrew Bell VK3WAB	Moorabbin & District RC Inc	PO Box 58, Highett,	3190. Tel 03 544 2758
Brian Fairless VK3ES	Moorabbin & District RC Inc	PO Box 58, Highett,	3190. Tel 03 592 7536
Jerry Viscaal VK3MQ	Moorabbin & District RC Inc	PO Box 58, Highett,	3190. Tel 03 704 6355 (AH)
Mark Diggins VK3JMD		1 Pembroke Cres, Cheltenham,	3192. Tel 03 583 7692 (AH)
Brett Leslie VK3JHP		35 Evesham Rd, Cheltenham,	3192. Tel 03 584 4230 (AH)
Gordon Buchanan VK3BGB	FAMPARC	PO Box 38, Frankston,	3199. Tel 03 789 7710
Jessie Buchanan VK3VAN	FAMPARC	4 Milford Cres, Karingal,	3199. Tel 03 789 7710
Gordon Dawe VK3GAD	FAMPARC	C/- 4 Milford Cres, Frankston,	3199. Tel 03 783 7717
Audrey Gibson VK3FI		94 Kars St, Frankston,	3199. Tel 03 783 8714
Len Gibson VK3SI		94 Kars St, Frankston,	3199. Tel 03 783 8714
Graham Wallington VK3BGL	FAMPARC	13 Milford Cres, Frankston,	3199. Tel 03 789 2972 (AH)
Ian Stowe VK3GA	FAMPARC	20 Norfolk Cres, Frankston North,	3200. Tel 03 785 2976 (AH)
Chas Gnaccarini VK3BRZ	Geelong Amateur Radio Club	66 Smeaton Close, Lara,	3212. Tel 052 82 3167 (AH)
John Collins VK3TKH	Geelong Amateur Radio Club	22 Elinbank Dve, Grovedale,	3216. Tel 052 43 0075
Keith Vriens VK3AFI	Geelong Amateur Radio Club	204 Myers St, Geelong,	3220. Tel 052 21 3658
Lee de Vries VK3PK	Geelong Amateur Radio Club	215 Swan Bay Rd, Wallington,	3221. Tel 052 50 1105 (AH)
Tom Evans VK3EGM	Colac Amateur Radio Club	PO Box 3, Cororooke,	3254. Tel 052 33 1412
Maggie Iaquinto VK3CFI	Colac Amateur Radio Club	PO Box 3, Cororooke,	3254. Tel 052 32 1118 (AH)
Rob Spalding VK3ERS	Colac Amateur Radio Club	PO Box 3, Cororooke,	3254. Tel 052 33 1412
Bill Bell VK3WK	Warrnambool R & E Club	PO Box 724, Warrnambool,	3280. Tel 055 65 9348 (BH)
Bill Dennis VK3XE	Warrnambool R & E Club	5 Karana Dve, Warrnambool,	3280. Tel 055 62 9132
Mona Swinton VK3BRE	Warrnambool R & E Club	PO Box 724, Warrnambool,	3280. Tel 055 62 6016
Trevor Dyson VK3DTV	Warrnambool R & E Club	RMB 5280, Yambuk,	3285. Tel 055 68 4228 (AH)
Ian Mason VK3DNQ	Warrnambool R & E Club	PO Box 10, Yambuk,	3285. Tel 055 68 4214
Harold Benson VK3VSX	Hamilton & District RC	PO Box 188, Hamilton,	3300. Tel 055 23 4773

Steve Curtis VK3CAX	Hamilton & District RC	PO Box 188, Hamilton,	3300. Tel 055 72 1355 (BH)
Ray Downes VK3ERD	Hamilton & District RC	PO Box 188, Hamilton,	3300. Tel 055 78 6352
Keith Heemskerk VK3AIH	Hamilton & District RC	PO Box 188, Hamilton,	3300. Tel 055 23 1977 (BH)
Reg Carter VK3CAZ	BARG	PO Box 216E, Ballarat East,	3350. Tel 053 41 7585 (AH)
Gordon Cornell VK3FGC	BARG	PO Box 216E, Ballarat East,	3350. Tel 053 39 2427 (AH)
Tom George VK3DMK	BARG	PO Box 216E, Ballarat East,	3350. Tel 053 32 7234 (BH)
Ian McDonald VK3AXH	BARG	PO Box 216E, Ballarat East,	3350. Tel 053 31 1317 (BH)
Charlie Stewart VK3DCS	BARG	PO Box 216E, Ballarat East,	3350. Tel 053 31 7425
Andy Squires VK3DTO	Horsham Amateur Radio Club	PO Box 720, Horsham,	3401. Tel 053 82 1439 (BH)
David Timms VK3YLV	Horsham Amateur Radio Club	PO Box 720, Horsham,	3401. Tel 053 82 5399 (BH)
Mark Weaver VK3KZZ	Horsham Amateur Radio Club	PO Box 720, Horsham,	3401. Tel 053 81 1711 (BH)
Leon Reichelt VK3KIT		PO Box 654, Horsham,	3402. Tel 053 84 8219 (AH)
Wally Maxwell VK3MJW	Sunbury ARC Inc	20 Kintore Close, Sunbury,	3429. Tel 03 744 6020
Ian Morris VK3DVO	Sunbury ARC Inc	PO Box 915, Sunbury,	3429. Tel 03 744 4326 (AH)
Craig Norris VK3TCN	Sunbury ARC Inc	PO Box 915, Sunbury,	3429. Tel 054 28 4154 (AH)
John Nunan VK3IC	Sunbury ARC Inc	PO Box 915, Sunbury,	3429. Tel 03 744 2506 (AH)
George Loft VK3AGM	Midland ARC Inc	28 Lawrence Street, Castlemaine,	3450. Tel 054 72 3476 (AH)
Alan Robinson VK3CUG	Midland ARC Inc	'Kerrimuir' RSD 181, Barkers Creek,	3451. Tel 054 74 2121
Maurie Milani VK3CWB	Sunraysia Amateur Exams	PO Box 30, Mildura,	3502. Tel 050 22 2120 (AH)
Peter Milne VK3PM	Sunraysia Amateur Exams	PO Box 30, Mildura,	3502. Tel 050 24 5814 (AH)
Watty Cameron VK3WMC	Midland ARC Inc	166 McKenzie Street West, Golden Square,	3555. Tel 054 47 0560 (AH)
Colin Lelean VK3CWL	Midland ARC Inc	11 Mathrick Street, Eaglehawk,	3556. Tel 054 46 9995 (AH)
Rex James VK3OF	Swan Hill & District ARC	PO Box 682, Swan Hill,	3585. Tel 050 33 1032
Daryl Manley VK3AMJ	Swan Hill & District ARC	PO Box 682, Swan Hill,	3585. Tel 050 32 1427
Dave Duff VK3JRA	Shepparton & District ARC	6 Yarramundi Crt, Murchison,	3610. Tel 058 26 2586 (AH)
George Jackson	Wodonga TAFE	Electronics Dept, 15 McKoy St Wodonga,	3690. Tel 060 55 6517 (BH)
Reg Jones VK3GC	Wodonga TAFE	Electronics Dept, 15 McKoy St Wodonga,	3690. Tel 057 56 2230 (AH)
Chris Solly	Wodonga TAFE	Electronics Dept, 15 McKoy St Wodonga,	3690. Tel 060 55 6517 (BH)
Peter O'Bryan VK3MU		PO Box 180, Yarrawonga,	3730. Tel 057 44 2176 (AH)
Hilton Younger VK3AHY		10 Witt St, Yarrawonga,	3730. Tel 057 44 3768
Derek Thurgood VK3DD	Healesville ARG Inc	PO Box 234, Yarra Glenn,	3775. Tel 03 730 1557 (AH)
Phil Hingeley VK3IN	Healesville ARG Inc	27 Westmount Rd, Healesville,	3777. Tel 059 62 2832
Graeme Tremellen VK3GPT	Healesville ARG Inc	PO Box 285, Healesville,	3777. Tel 059 62 4111
Gavin Hobbs VK3TLN	Healesville ARG Inc	PO Box 105, Cockatoo,	3781. Tel 059 68 8482
John Hill VK3WZ		6 Cumberland Way, Endeavour Hills,	3802. Tel 03 700 5428
Graeme Brown VK3BXG	VK3 Eastern Zone Education	RMB 8375 Pryor Rd, Drouin,	3818. Tel 056 23 1227 (BH)
Colin Dyason VK3PJ	VK3 Eastern Zone Education	66 Colquhoun Blvd, Warragul,	3820. Tel 056 23 4655 (BH)
Bernard Henne VK3YTT	VK3 Eastern Zone Education	12 Ash St, Morwell,	3840. Tel 051 34 4275 (AH)
Peter Freeman VK3KAI	VK3 Eastern Zone Education	PO Box 273, Churchill,	3842. Tel 051 22 2550 (AH)
Henk Pillekers VK3CAQ	VK3 Eastern Zone Education	PO Box 65, Churchill,	3842. Tel 051 22 1885 (AH)
Brian Young VK3BBB	VK3 Eastern Zone Education	48 Washington St, Traralgon,	3844. Tel 051 76 1167
Patrick Bond VK3GEE		PO Box 87, Rosedale,	3847. Tel 051 99 2811
George Hoddinott VK3AYI	WIA East Gippsland Zone	Lot 23 Acacia Rd, Raymond Island,	3880. Tel
Kevin McGrath VK3EQM	WIA East Gippsland Zone	12 Government Rd, Paynesville,	3880. Tel 051 56 6938
Bob Neal VK3ZAN	WIA East Gippsland Zone	76 Langford Pde, Paynesville,	3880. Tel 051 56 7654
John Piovesan VK3GU	WIA East Gippsland Zone	15 Gilsenan St, Paynesville,	3880. Tel 051 56 6110
Bob Dickinson VK3BLD		94 Dunlop St, Bittern,	3918. Tel 059 83 9162
Steven Mathias VK3ZXR		3/95 Lorimer St, Crib Point,	3919. Tel 059 83 6197 (AH)
Frank Feldman VK3BC	Southern Peninsula Radio Club	30 Armstrong Rd, McCrae,	3938. Tel 059 86 2031
Vic Vickery VK3DEA	Southern Peninsula Radio Club	11 Flamingo Rd, Rosebud West,	3940. Tel 059 86 1327
Barry Wilton VK3XV		PO Box 260, Cranbourne,	3977. Tel
Lindsay Allen VK3LFA	Community D/L Wonthaggi Inc	13 Epsom St, Wonthaggi,	3995. Tel 056 72 2563
Colin Thomson VK3VBU	Community D/L Wonthaggi Inc	20 Fuller Rd, Wonthaggi,	3995. Tel 056 72 3144
Ted Trinder VK3JMT	Community D/L Wonthaggi Inc	1 Campbell St, Wonthaggi,	3995. Tel 056 72 2307
Ted Raven VK4KRR	QRV Exam Service	22 David St, Toombul,	4012. Tel 07 266 6197
Bob Godfrey VK4BOB	Department of Education QLD	20 Buckra St, Bracken Ridge,	4017. Tel 07 269 5380 (AH)
Rodger Bingham VK4HD	Redcliffe Radio Club	PO Box 20, Woody Point,	4019. Tel 074 96 4553
Peter Breed VK4PB	Redcliffe Radio Club	PO Box 20, Woody Point,	4019. Tel 07 284 1960
John Presotto VK4WX	Redcliffe Radio Club	PO Box 20, Woody Point,	4019. Tel 07 283 1329 (AH)
Bob Neville VK4ACL	QRV Exam Service	124 Roscommon Rd, Boondall,	4034. Tel 07 265 3104
Ron Everingham VK4EV	Brisbane ARC	30 Hunter St, Everton Park,	4053. Tel 07 355 4308 (AH)
Garry Hawgood VK4KE	Radio Amateurs Group	9 Ararat St, Riverhills,	4074. Tel 07 279 0278
Murray Kelly VK4AOK	WIAQ Examinations Service	29 Molonga Tce, Graceville,	4075. Tel 07 379 3307
Steve Vaughan VK4YEK	Brisbane ARC	PO Box 300, Darra,	4076. Tel 07 849 8156
George Nelson VK4WZ	Brisbane ARC	96 Ekibin Rd, Annerley,	4103. Tel 07 848 2456
Roy O'Malley VK4ZQ	WIAQ Examinations Service	Emtronics QLD P/L, 416 Logan Rd Stones Cnr,	4120. Tel 07 394 2555 (BH)
Keith Griffin VK4IO	Bayside District ARS Inc	20 Kordick St, Carina,	4152. Tel 07 398 6013 (AH)
Ian Campbell VK4TK	Bayside District ARS Inc	PO Box 411, Capalaba,	4157. Tel 07 824 1518 (AH)
Roy Mahoney VK4BAY	Bayside District ARS Inc	PO Box 411, Capalaba,	4157. Tel 07 396 1655
George Roberts VK4BSH	Bayside District ARS Inc	PO Box 411, Capalaba,	4157. Tel 07 206 7298 (AH)
Alf Brown VK4AEJ	Bayside District ARS Inc	114 Panorama Dve, Thornlands,	4164. Tel 07 286 4779
Len Holbrok VK4DDK	Gold Coast ARS Inc	PO Box 1837, Southport,	4215. Tel 075 32 5255 (BH)
Nic Chantler VK4DIT	Gold Coast ARS Inc	PO Box 6620, Gold Coast Mail Centre,	4217. Tel 075 39 6609 (AH)
John Harvey VK4XJH	Gold Coast ARS Inc	PO Box 5159, Gold Coast Mail Centre,	4217. Tel 075 32 0400 (BH)
Robert White VK4TRW	Gold Coast ARS Inc	5 McCubbin Crt, Burleigh Heads,	4220. Tel 075 35 2222 (AH)
George Walters VK4VGW	Gold Coast ARS Inc	64 Bateke Rd, Mt Tamborine,	4272. Tel 075 45 2148
Mai Beck	Concordia College Toowoomba	154 Stephen St, Toowoomba,	4350. Tel 076 36 1700 (BH)
Graham Weier VK4AGN		C/- 58 Water St, Toowoomba,	4350. Tel 076 39 2219 (BH)
Cliff Jenkins VK4QJ		'Weer Heer' MS 1073, Crows Nest,	4355. Tel 076 98 1223
Bob Harper VK4KNH	Cunningham Radio Club	158 Wood St, Warwick,	4370. Tel 076 61 1273 (AH)
John Moulder VK4YX	Cunningham Radio Club	PO Box 323, Warwick,	4370. Tel 076 61 3131 (BH)
Graham Rayner VK4GDR	Cunningham Radio Club	PO Box 93, Glen Aplin,	4381. Tel 076 83 4336 (AH)
Neil Holmes VK4NF	Dalby & District ARC	15 Bunya St, Dalby,	4405. Tel 076 62 4950
Reg Kerslake VK4AOU	Dalby & District ARC	88 Patrick St, Dalby,	4405. Tel 076 62 2193

Margaret Schwerin VK4OE	Dalby & District ARC	'Rosedale' MS 902, Dalby,	4405. Tel 076 62 3934
David Jones VK4OF	WIAQ Examinations Service	18 Browning Crt, Strathpine,	4500. Tel 07 205 1561
Nev Mills VK4KOP	WIAQ Examinations Service	49 Viscount St, Bray Park,	4500. Tel 07 205 4532 (AH)
Bill Yates VK4YWY	QRV Exam Service	29 Brittainy St, Petrie,	4502. Tel 07 285 1462 (BH)
Brian Berry VK4BDB	WIAQ Examinations Service	42 Laver St, Morayfield,	4506. Tel 074 98 5754 (AH)
Charlie Strong VK4YZ	Redcliffe Radio Club	St M's Old Toorbul Pt Rd, Caboolture,	4510. Tel 074 95 1565
Ken Hanby VK4IS	Sunshine Coast ARC	17 Kig Hts 14 Queen St, Caloundra,	4551. Tel 074 91 5532
Max Vincent VK4ZMV	Odbrook Pty Ltd	PO Box 10, Golden Beach,	4551. Tel 074 92 2710
Jack Cornes VK4VAH	Gympie Amateur Radio Club Inc	43 Mellor St, Gympie,	4570. Tel 074 82 2443
Fran Walker VK4NSN	Gympie Amateur Radio Club Inc	86 Noosa Rd, Gympie,	4570. Tel 074 82 5325
Roy Winchester VK4IRW	Gympie Amateur Radio Club Inc	Lot 4 Jeremy Rd, Gympie,	4570. Tel 074 82 7823
Ron MacNamara VK4ESC	Sunshine Coast ARC	23 Callitris Cres, Marcus Beach,	4573. Tel 074 48 1886
Bruce Bussenschutt VK4OR	Sunshine Coast ARC	2 Dewrang Pl, Wurtulla Sunshine Coast,	4575. Tel 074 93 1380
Ian Mowat VK4ZS		MS 648, Yarraman,	4614. Tel 071 63 8261
Gerry Fulton VK4GJ	Hervey Bay Amateur Radio Club	PO Box 829, Hervey Bay,	4655. Tel 071 28 3232
Gray Taylor VK4OH	Hervey Bay Amateur Radio Club	PO Box 526, Hervey Bay,	4655. Tel 071 25 7167
Ted Watson VK4EAW	Hervey Bay Amateur Radio Club	PO Box 829, Hervey Bay,	4655. Tel 071 28 3489
Reg Wheller VK4ARW	Hervey Bay Amateur Radio Club	PO Box 829, Hervey Bay,	4655. Tel 071 28 1383
Ken Blatchford VK4BKB	BARC Inc Exam Service	9 Que Hee St, Bundaberg,	4670. Tel 071 51 3195
Gerard Feerick VK4YK	BARC Inc Exam Service	M/S 108 Hoffmans Rd, Burnett Heads,	4670. Tel
Bob Millgate VK4ADZ	BARC Inc Exam Service	9 Chapman St, Booloolah Bundaberg,	4670. Tel 071 52 7482
Bernie Smallman VK4BFS		6 Williams St, MS 108 Burnett Heads,	4670. Tel 071 59 4483
Clem Steggink VK4FD	BARC Inc Exam Service	38 Moncrieff St, Bundaberg,	4670. Tel 071 52 1876
John Lobie VK4DJL	Gladstone Exam Service	98 Barney St, Gladstone,	4680. Tel 079 79 2291 (AH)
Noela MacDonald VK4ANJ	Gladstone Exam Service	98 Barney St, Gladstone,	4680. Tel 079 72 5494 (AH)
Vic MacDonald VK4CA	Gladstone Exam Service	98 Barney St, Gladstone,	4680. Tel 079 72 5494 (AH)
Merv Deakin VK4DV		PO Box 380, Rockhampton,	4700. Tel 079 34 0193
Lyle Dobbs VK4ALD	WIAQ CQ Branch Rockhampton	265 Carpenter St, Rockhampton,	4701. Tel 079 31 2775 (BH)
Nick Quigley VK4CNQ	WIAQ CQ Branch Rockhampton	265 Carpenter St, Rockhampton,	4701. Tel 079 31 2388 (BH)
Clive Sait VK4ACC	WIAQ CQ Branch Rockhampton	265 Carpenter St, Rockhampton,	4701. Tel 079 28 1173 (AH)
David Wilson VK4UN	Central Highlands ARC	6 Gum St, Tieri,	4709. Tel 079 84 8442
Maurie Wright VK4YEN	Central Highlands A R C	25 Cassia Street, Tieri,	4709. Tel 079 84 8384 (AH)
Don Blanch VK4ZFB	Biloela ARC	109 Grevillea Street, Biloela,	4715. Tel
Glyn Gibbings-Johns VK4LA	Biloela ARC	PO Box 966, Biloela,	4715. Tel 079 92 3381
Hank Hahn VK4VCD	Biloela ARC	25 Don Street, Biloela,	4715. Tel 079 92 1386
Mark Haseman VK4CMH	Biloela ARC	PO Box 315, Biloela,	4715. Tel 079 92 2491
John Petersen VK4AXA	Central Highlands ARC	48 Littlefield St, Blackwater,	4717. Tel 079 82 5126
Jim Storch VK4JVS		PO Box 147, Blackwater,	4717. Tel 079 82 6279
James West		41 Blain St, Blackwater,	4717. Tel 079 82 6756 (AH)
Lloyd West VK4QE		41 Blain St, Blackwater,	4717. Tel 079 82 6756 (AH)
Geoff Bonney VK4GI	TAFE College Emerald	Capricorn Hwy, Emerald,	4720. Tel 079 82 3699 (BH)
Bob Lee VK4CWL	Central Highlands ARC	PO Box 617, Emerald,	4720. Tel 079 82 1096 (BH)
Pete Foster VK4COU		Cardbeign St, Springsure,	4722. Tel 079 86 1882
Allan Abbott VK4ABP	Central Highlands ARC	PO Box 493, Longreach,	4730. Tel 076 58 3111 (BH)
Lyle Farraher VK4KXM	Central Highlands ARC	PO Box 75, Longreach,	4730. Tel 076 58 3793 (AH)
Ed Roache VK4KAA	Central Highlands ARC	48 Wompoo Rd, Longreach,	4730. Tel 076 58 3062
Ron Graham VK4BRG	Central Highlands ARC	Box 323, Sarina,	4737. Tel 079 56 1155
Wal Douglas VK4AIV	Mackay Amateur Radio Assoc	PO Box 1065, Mackay,	4740. Tel 079 42 1615 (AH)
John Gillespie VK4MTF	Mackay Amateur Radio Assoc	PO Box 1065, Mackay,	4740. Tel 079 55 2006 (AH)
George Glendinning VK4AJL	Mackay Amateur Radio Assoc	PO Box 1065, Mackay,	4740. Tel 079 59 2436 (AH)
John James VK4CMA	Mackay Amateur Radio Assoc	PO Box 1065, Mackay,	4740. Tel 079 55 2333 (AH)
Keith Carter VK4CKC	Bowen & Collinsville ARC	22 Soldiers Rd, Bowen,	4805. Tel 077 86 2497
Brian Winterburn VK4BOW		7 Hay St, Bowen,	4805. Tel 077 86 2367
Alan Stephenson VK4PS	Townsville ARC Inc	PO Box 5315 MSO, Townsville,	4810. Tel 077 71 2513
John Stevens VK4AFS	Townsville ARC Inc	GPO Box 419, Townsville,	4810. Tel 077 22 1113 (BH)
Ian Sutton VK4ZT	Townsville ARC Inc	PO Box 964, Townsville,	4810. Tel 077 71 1211 (BH)
Roger Cordukes VK4CD	Townsville ARC Inc	1620 Ross River Rd, Kelso,	4815. Tel 077 74 0221 (AH)
Bruce Jones VK4KIT	Mount Isa & District ARG	57 Brett Ave, Mount Isa,	4825. Tel 077 43 5618 (AH)
Robert Mackie VK4SWR	Mount Isa & District ARG	PO Box 1429, Mount Isa,	4825. Tel 077 43 0123 (AH)
Keith Noll VK4AKA	Mount Isa & District ARG	23 Abel Smith Pde, Mount Isa,	4825. Tel 077 43 3116 (AH)
Roger Wood VK4ARZ	Mount Isa & District ARG	PO Box 1715, Mount Isa,	4825. Tel 077 43 5935 (AH)
Ted Golledge VK4AVG	Tropical Coast ARC	PO Box 1019, Innisfail,	4860. Tel 070 61 4517 (AH)
John Mahoney VK4JON	Cairns Amateur Radio Club Inc	PO Box 194, Innisfail,	4860. Tel 070 61 3857
Les Meier VK4EMI	Tropical Coast ARC	48 Laurie St, Innisfail,	4860. Tel 070 61 2932 (AH)
Graham Bennett VK4FGB	Cairns Amateur Radio Club Inc	PO Box 1914, Cairns,	4870. Tel 070 54 1448
Pat Laurenzi VK4MP	Cairns Amateur Radio Club Inc	PO Box 1426, Cairns,	4870. Tel 070 54 4157 (AH)
Chris Parr VK4ANI	Cairns Amateur Radio Club Inc	PO Box 1215, Cairns,	4870. Tel 070 51 0452 (AH)
Wilf Booth VK4ZNZ	Tableland Radio Club	MS 1318 McLean Rd, Yungaburra,	4872. Tel 070 95 3888
Tom Debel VK4NIM	Tableland Radio Club	PO Box 13, Kairi,	4872. Tel 070 95 8217
Rene Brank VK4MES	Thursday Island ARC	PO Box 410, Thursday Island,	4875. Tel 070 69 1854 (AH)
Rex East VK4MIA	Thursday Island ARC	PO Box 418, Thursday Island,	4875. Tel 070 69 1679
Bill Lochridge VK4WL	Torres Straits Examinations	C/-Post Office, Thursday Island,	4875. Tel 070 69 1446 (AH)
Ron Goodhew VK4EMF	Tableland Radio Club	PO Box 253, Mareeba,	4880. Tel 070 92 2888 (BH)
Aubrey McKibben VK4AFO	Tableland Radio Club	PO Box 102, Malanda,	4885. Tel 070 96 5962 (AH)
Chuck Waite VK5CQ	WIA (SA Div) Inc	GPO Box 222, Adelaide,	5001. Tel 08 289 2146 (AH)
Graeme Bottger VK5AHQ	Port Adelaide Radio Club	68 Alma Terrace, Woodville West,	5011. Tel 08 45 7465 (AH)
Harry Hillard VK5AHH	Port Adelaide Radio Club	PO Box 265, Port Adelaide,	5015. Tel 08 49 7664
John McKellar VK5BJM	Port Adelaide Radio Club	5 Diosma Cres, Lockleys,	5032. Tel 08 43 8386 (AH)
Christine Taylor VK5CTY	Taylor Radio Group	16 Fairmont Avenue, Black Forest,	5035. Tel 08 293 5615
Geoff Taylor VK5TY	Taylor Radio Group	16 Fairmont Avenue, Black Forest,	5035. Tel 08 293 5615
Rob Gurr VK5RG		PO Box 35, Daw Park,	5041. Tel 08 276 4547
Donald McDonald VK5ADD	WIA (SA Div) INC	6 Whittier Ave, Marion,	5043. Tel 08 276 1251
Phil Day VK5QT	Adelaide Hills ARS Inc	15 Main Rd, Belair,	5052. Tel 08 366 2214 (BH)
Murray Burford VK5ZQ	WIA (SA Div) INC	261 Belair Rd, Torrens Park,	5062. Tel 08 276 3393

Hans Smit VK5YX	Adelaide Hills ARS Inc	6 Jeffrey St, Hawthorn,	5062. Tel 08 271 5350 (AH)
Rowland Bruce VK5OU	WIA (SA Div) INC	42 Gleneagles Rd, Mt Osmond,	5064. Tel 08 379 4584
George Lindop VK5BGL	Port Adelaide Radio Club	28 Dyott Ave, Hampstead Gardens,	5086. Tel 08 261 5910
Rick Grivell VK5GV	North East Radio Club	43 Lincoln Cres, Pooraka,	5095. Tel 08 262 5152 (AH)
Bill Wardrop VK5AWM	WIA (SA Div) INC	PO Box 303, St Agnes,	5097. Tel 08 251 2154 (AH)
Rob Gunnourie VK5FI	WIA (SA Div) INC	99 Maxwell Rd, Ingle Farm,	5098. Tel 08 264 6581
Ivan Huser VK5QV	South East Radio Group Inc	PO Box 1103, Mount Gambier,	5290. Tel 087 25 5514
Trevor Niven VK5NC	South East Radio Group Inc	PO Box 1103, Mount Gambier,	5290. Tel 087 25 5593 (AH)
Kevin O'Rorke VK5OA	South East Radio Group Inc	PO Box 1103, Mount Gambier,	5290. Tel 087 25 3079
Bert Trupp VK5BVN	South East Radio Group Inc	PO Box 1103, Mount Gambier,	5290. Tel 087 24 9826 (AH)
Clive Harman VK5ACH	Riverland Amateur Radio Club	PO Box 628, Renmark,	5341. Tel 085 86 4204
Mike Mackintosh VK5CK	Riverland Amateur Radio Club	PO Box 646, Renmark,	5341. Tel 085 84 7101 (BH)
John Ruston VK5ARK	Riverland Amateur Radio Club	PO Box 98, Renmark,	5341. Tel 085 86 6127
Hugh Lloyd VK5BC	Riverland Amateur Radio Club	PO Box 743, Berri,	5343. Tel 085 82 2690
Graham Johnston VK5SU	Mid North Repeater Group	25 Square St, Port Pirie,	5540. Tel 086 32 4122 (BH)
Keith Pettman VK5NAX	Mid North Repeater Group	31 Henry St, Port Pirie,	5540. Tel 086 32 3273 (AH)
Leo Vette VK5NLV		36 Ferme St, Port Pirie,	5540. Tel 086 33 0485 (AH)
David Bice VK5QU	Moonta Scout Group ARC	PO Box 133, Moonta,	5558. Tel 088 25 2263
John Vayne VK5BL	Moonta Scout Group ARC	PO Box 133, Moonta,	5558. Tel 088 25 2798
Jack Kleinrahm VK5AJK	Lower Eyre Peninsula ARC Inc	11 Luke St, Port Lincoln,	5606. Tel 086 82 1466 (BH)
Jack Martin VK5EJ	Lower Eyre Peninsula ARC Inc	PO Box 937, Port Lincoln,	5606. Tel 086 82 3131 (AH)
John Plevin VK5AEP	Lower Eyre Peninsula ARC Inc	18 Wandana Ave, Port Lincoln,	5606. Tel 086 82 3161
Peter Baker VK5BWI	WHYCOM SA	49 Basyyan Cres, Whyalla Stuart,	5608. Tel 086 45 2460 (BH)
Stuart Crowther VK5BWC	Whyalla Amateur Radio Club	68 Acacia Dve, Whyalla Stuart,	5608. Tel 086 45 4331 (AH)
Joe Nebl VK5PWC	Whyalla Amateur Radio Club	C/- PO Box 444, Whyalla Norrie,	5608. Tel
Alan Gilchrist VK5BWG	Port Augusta ARC	6 Kinnear Street, Port Augusta,	5700. Tel 086 43 6455 (AH)
Peter Horgan VK5BWH	Port Augusta ARC	6 Kinnear Street, Port Augusta,	5700. Tel 086 42 2363 (AH)
Bill Offler VK5BWO	Port Augusta ARC	6 Kinnear St, Port Augusta,	5700. Tel 086 42 2855 (AH)
Phil Jamieson VK6ZPP	Northern Corridor Radio Group	11 Bromley Place, Kingsley,	6026. Tel 09 409 1156 (AH)
Bryce Erskine VK6KBE	Northern Corridor Radio Group	90 Balga Ave, Balga,	6061. Tel 09 349 9489
Phil Street VK6KS	Northern Corridor Radio Group	PO Box 97, Mirrabooka,	6061. Tel 09 344 5241 (AH)
Dianne Cousins VK6BC		2 Nottingham St, East Victoria Park,	6101. Tel 09 361 3985
Glenn Cousins VK6AUZ		2 Nottingham St, East Victoria Park,	6101. Tel 09 361 3985
Clyde Hillsdon VK6ZCH		3 Youngs Place, Parmelia,	6167. Tel 09 419 5764 (AH)
Frank Langford VK6BLA	Peel Amateur Radio Group Inc	10 Clipper Way, Halls Head,	6210. Tel 09 581 5028
Rev Suter VK6SA	The Amateur Radio Exam Centre	PO Box 261, Mandurah,	6210. Tel
Con Murphy VK6PM		PO Box 88, Yarloop,	6218. Tel 097 33 1978
Allen Byrne VK6OT	Bunbury Radio Club Inc	C/- PO Box 31, Bunbury,	6230. Tel
Bill Harrison VK6WJH	Bunbury Radio Club Inc	PO Box 31, Bunbury,	6230. Tel 097 34 4374 (AH)
Barry Mitchell VK6HX	Bunbury Radio Club Inc	9 Henley Dve, Bunbury,	6230. Tel 097 91 1599 (AH)
Murray Peacock VK6YD	Bunbury Radio Club Inc	PO Box 31, Bunbury,	6230. Tel 097 21 5442
John Thornborough VK6AJJ	Bunbury Radio Club Inc	PO Box 31, Bunbury,	6230. Tel 097 97 1126
Peter Havord VK6BRN	Southern Electronics Group	PO Box 1491, Albany,	6330. Tel 098 41 8028 (AH)
Bill Hoare VK6YWH	Southern Electronics Group	3 Finlay St, Albany,	6330. Tel 098 41 6315
Aubrey Keightley VK6XY	Southern Electronics Group	242 Serpentine Rd, Albany,	6330. Tel 098 41 3104
Tom Reed VK6TR	Southern Electronics Group	Lot 25 Shellbay Rd, Lower King,	6330. Tel 098 447395
Ron Howrie VK6ANR	Goldfields ARG	PO Box 1281, Kalgoorlie,	6430. Tel 090 91 4457
Alan Ransley VK6AJO	Goldfields ARG	214 McDonald St, Kalgoorlie,	6430. Tel 090 21 7746 (AH)
Allan Juggins VK6QJ	Esperance ARS	PO Box 965, Esperance,	6450. Tel 090 71 3090 (AH)
Graeme Smith VK6ATS	Esperance ARS	12 Young Place, Esperance,	6450. Tel 090 71 2801 (AH)
Bob Marlow VK6PJ	Geraldton Amateur Radio Club	PO Box 2004, Geraldton,	6530. Tel 099 21 1367 (AH)
Gordon Williams VK61U		PO Box 259, Northampton,	6535. Tel 099 34 1259
Steve Hill VK6PA	ARS Northwest Australia Inc	PO Box 410, Wickham,	6720. Tel 091 85 4510 (AH)
Dave Holt VK6YA	ARS Northwest Australia Inc	PO Box 410, Wickham,	6720. Tel 091 87 1926
Peter Dowd VK7PR	WIA Tasmanian Division	12 Susan Pde, Lenah Valley,	7008. Tel
Reg Emmett VK7KK	WIA TAS DIV Southern Branch	PO Box 26, Rokeby,	7019. Tel 002 48 6824 (AH)
Graeme Reardon VK7ZGG	WIA TAS DIV Northern Branch	2 Trent St, Youngtown,	7249. Tel 003 44 6636 (AH)
Bill Bower VK7AV	WIA TAS DIV Northern Branch	40 Amy Rd, Launceston,	7250. Tel 003 44 1584 (AH)
Mike Collinson VK7MA	WIA TAS DIV Northern Branch	PO Box 986, Launceston,	7250. Tel 003 26 0751 (BH)
Ron Churcher VK7RN	WIA Tasmanian Division	PO Box 277, Devonport,	7310. Tel 004 24 6366 (AH)
Tony Clayton VK7AH	WIA Tasmanian Division	10 Wrenswood Dve, Quoiba,	7310. Tel 004 24 5375 (AH)
Phil Harbeck VK7PU	WIA Tasmanian Division	14 Kennedy St, Burnie,	7320. Tel 004 31 3020
Clarrie Hilder VK7HC	WIA Tasmanian Division	5 Speed St, Cooee,	7320. Tel 004 31 8211
Shane Lynd VK7KHZ	WIA Tasmanian Division	14 Read St, Tullah,	7321. Tel 004 73 4256 (AH)
Steve Bush VK7EQ	WIA Tasmanian Division	PO Box 123, Somerset,	7322. Tel 004 35 1043
Dick Van Beek VK7KVB	WIA Tasmanian Division	31 Beech Dve, Rosebery,	7470. Tel 004 73 1693 (AH)

ar

Don't buy stolen equipment — check the serial number against the WIA stolen equipment register first.

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μ V in 50 Ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used to make these prediction is 64.2, next month's prediction is 63.0.

Last year alternative formats for the presentation were sought. No requests for alternatives were received, only requests not to change, so this data will continue in its present format with only slight changes for such things as type fonts. This month a graph showing the change in sunspot number over the last couple of years is included. It is provided by IPS Radio and Space Services, Department of Administrative Services.

The predicted sunspot number is shown to decline during this year.

This is an indication of average activity; the occasional exceptional band openings will be there for those who seek them.

ar

Tx : VK EAST Rx : Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.0	7	9.8	7	4	-3	-16	-32
2	14.5	5	11.0	4	5	0	-10	-23
3	14.2	0	10.8	0	2	-2	-11	-23
4	16.7	2	12.6	-4	3	1	-4	-13
5	21.1	4	15.0	-7	3	4	2	-4
6	21.9	4	15.3	-9	2	4	2	-3
7	22.0	4	15.4	-9	2	4	2	-2
8	22.1	5	15.4	-7	3	5	3	-2
9	21.0	6	15.4	-3	5	6	2	-4
10	19.6	7	15.3	1	7	6	1	-7
11	18.1	8	14.5	6	8	5	-1	-11
12	16.6	10	13.3	10	9	4	-5	-17
13	15.6	13	12.4	14	10	3	-9	-23
14	14.8	18	11.7	19	11	1	-13	-29
15	14.1	23	11.1	23	11	0	-17	-37
16	13.5	26	10.5	24	10	-3	-22	...
17	12.9	28	10.0	24	8	-6	-27	...
18	12.4	29	9.4	23	6	-10	-32	...
19	12.0	30	9.1	22	4	-12	-36	...
20	12.7	29	8.7	24	7	-8	-30	...
21	12.1	26	8.3	19	3	-12	-35	...
22	11.7	20	8.1	14	0	-14	-36	...
23	11.5	14	8.0	10	-1	-15	-35	...
24	12.3	9	8.6	9	0	-10	-27	...

Tx : VK EAST Rx : Europe L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.2	-5	8.5	1	-2	-10	-23	...
2	11.3	-1	8.6	3	-2	-10	-25	...
3	11.3	3	8.7	5	-1	-11	-27	...
4	10.8	7	8.4	7	-3	-15	-34	...
5	9.9	10	7.8	6	-7	-22	...	...
6	10.0	16	7.9	8	-7	-24	...	...
7	11.9	24	9.4	17	2	-13	-34	...
8	15.4	22	12.3	25	15	4	-10	-27
9	15.5	21	11.8	23	16	8	-3	-17
10	14.9	14	11.3	14	11	4	-6	-18
11	16.5	7	13.1	5	7	4	-3	-13
12	15.6	1	12.4	-2	2	0	-6	-15
13	14.9	-5	12.0	-7	0	-1	-7	-16
14	14.2	-10	11.1	-10	-2	-2	-8	-16
15	13.6	-14	10.4	-11	-3	-3	-8	-17
16	12.9	-18	9.8	-11	-3	-4	-9	-18
17	12.5	-19	9.4	-11	-3	-4	-10	-19
18	13.2	-17	9.8	-12	-3	-3	-9	-17
19	15.3	-9	12.1	-14	-3	-2	-6	-13
20	17.4	-4	13.5	-15	-3	-1	-4	-10
21	15.1	-7	11.6	-10	-2	-2	-7	-16
22	13.2	-9	10.1	-5	-1	-4	-12	-23
23	12.1	-9	9.2	-2	-1	-6	-16	-29
24	11.5	-8	8.7	0	-2	-8	-20	-35

Tx : VK EAST Rx : Sth Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.9	25	24.8	33	36	35	32	27
2	30.5	25	25.2	34	36	35	32	28
3	30.5	26	25.1	35	37	36	33	28
4	30.2	26	24.7	37	38	37	33	29
5	29.5	27	24.1	39	40	37	33	28
6	28.4	28	23.1	43	42	39	34	28
7	26.9	30	21.8	49	45	40	34	27
8	25.3	32	20.4	50	45	39	33	25
9	23.6	33	18.9	50	44	38	30	21
10	22.0	34	17.6	49	42	36	27	17
11	21.1	35	16.8	49	42	35	25	14
12	20.3	35	16.0	48	40	33	23	12
13	19.3	36	15.2	48	39	31	20	8
14	18.2	37	14.2	46	37	28	17	4
15	17.2	38	13.3	45	35	26	13	0
16	16.0	39	12.3	44	32	22	8	-6
17	14.8	40	11.3	42	29	17	2	-13
18	15.0	39	11.3	41	29	18	3	-13
19	17.6	34	13.2	40	33	24	13	0
20	21.9	30	16.7	38	35	31	23	14
21	25.5	28	19.7	37	36	34	29	22
22	27.1	27	21.3	35	36	34	30	24
23	27.8	26	22.2	33	35	34	30	25
24	28.9	26	23.5	33	35	34	31	26

Tx : VK EAST Rx : Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.6	13	22.1	12	19	20	18	14
2	28.4	12	21.6	10	18	19	17	12
3	28.8	12	22.4	10	18	19	17	13
4	29.4	13	22.3	11	19	20	18	14
5	30.2	13	23.0	13	21	22	20	16
6	30.6	15	24.0	17	23	24	22	18
7	29.4	16	23.9	22	26	25	22	17
8	28.0	18	23.4	30	30	28	23	17
9	26.7	20	21.6	38	35	30	23	16
10	25.2	21	20.2	40	35	29	21	12
11	23.9	22	19.1	41	35	28	19	9
12	23.4	22	18.6	42	35	28	18	7
13	22.7	23	18.0	43	35	27	17	5
14	21.8	23	17.7	42	33	25	14	2
15	20.3	24	15.9	40	30	21	9	-4
16	19.0	24	14.8	38	27	17	3	-11
17	17.4	25	13.5	35	23	11	-5	-22
18	15.7	26	12.1	31	16	2	-17	-38
19	14.1	26	10.9	25	7	-10	-34	...
20	12.7	26	9.8	19	-2	-23	...	...
21	16.5	20	12.4	26	15	3	-13	-32
22	23.8	16	18.4	25	24	21	13	5
23	27.0	15	21.5	19	23	22	18	13
24	27.4	14	22.1	15	21	21	17	12

Tx : VK EAST Rx : Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.3	-2	8.6	2	-3	-13	-29	...
2	10.7	-11	8.2	-1	-4	-13	-29	...
3	14.1	-4	10.9	-3	0	-4	-13	-25
4	20.5	4	15.8	-9	2	4	1	-4
5	26.7	6	20.5	-15	1	6	7	5
6	28.9	8	21.9	-18	0	7	9	8
7	28.3	8	22.4	-17	1	7	9	8
8	27.3	8	22.2	-12	3	8	9	8
9	26.0	10	21.6	-4	8	11	11	7
10	24.5	12	19.8	4	13	14	11	7
11	22.9	15	18.4	14	18	16	12	5
12	21.5	18	17.1	22	22	18	11	3
13	20.7	21	16.4	30	26	20	11	1
14	19.9	24	15.8	35	28	20	10	-1
15	19.1	25	15.5	36	27	19	8	-4
16	18.1	26	14.1	36	26	17	4	-9
17	17.1	27	13.3	35	24	14	0	-14
18	15.9	28	12.3	33	21	10	-5	-22
19	14.8	29	11.3	30	17	5	-12	-31
20	14.9	29	11.3	31	18	5	-11	-30
21	17.5	25	13.2	33	24	14	1	-14
22	14.5	21	11.1	22	12	1	-14	-32
23	13.9	16	10.8	15	8	-1	-16	-34
24	13.7	9	10.4	9	4	-4	-18	-34

Tx : VK EAST Rx : USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.3	6	17.6	-6	5	7	5	0
2	21.0	8	15.9	1	8	8	3	-4
3	18.8	9	14.2	7	10	7	0	-10
4	17.0	12	12.8	13	11	5	-5	-18
5	16.0	16	12.0	18	12	3	-9	-24
6	15.3	20	11.4	22	13	2	-13	-31
7	14.6	24	11.1	25	13	0	-17	-37
8	14.2	26	10.6	26	11	-2	-21	...
9	13.8	27	10.4	26	10	-4	-24	...
10	12.6	29	9.5	22	4	-12	-35	...
11	10.9	30	8.3	16	-6	-27	...	...
12	10.6	31	8.2	14	-8	-30	...	...
13	13.3	28	9.9	25	8	-7	-29	...
14	14.5	27	11.2	28	14	1	-16	-36
15	13.0	21	10.1	18	6	-7	-26	...
16	16.1	16	12.4	18	13	6	-5	-19
17	14.7	9	11.2	9	7	0	-11	-25
18	14.7	3	11.1	2	3	-1	-10	-23
19	17.2	2	13.0	-4	3	2	-3	-12
20	21.5	5	16.4	-11	2	5	3	-1
21	25.0	6	19.4	-15	1	5	6	3
22	26.3	6	20.4	-17	0	5	6	4
23	26.9	6	20.5	-16	1	6	7	5
24	25.6	6	19.4	-12	3	6	6	3

Tx : VK SOUTH Rx : Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.0	13	10.3	13	8	0	-12	-28
2	15.1	11	11.4	10	8	2	-9	-22
3	17.8	9	14.0	7	9	6	-1	-10
4	22.0	8	15.6	2	9	9	5	-1
5	22.7	7	16.2	-2	7	8	5	0
6	22.8	7	16.3	-4	6	7	5	0
7	22.8	6	16.2	-4	6	7	5	0
8	22.6	7	16.1	-4	6	7	5	0
9	22.3	7	15.8	-1	7	8	5	-1
10	21.4	8	15.1	3	9	9	4	-2
11	20.1	10	14.1	7	11	8	2	-6
12	18.4	11	12.9	11	11	7	0	-11
13	16.9	13	11.8	15	12	5	-5	-18
14	15.6	17	10.9	19	12	3	-10	-26
15	14.6	22	10.2	23	12	0	-16	-34
16	13.8	25	9.5	24	10	-3	-22	...
17	13.2	27	9.2	23	8	-6	-27	...
18	12.5	28	8.8	22	5	-11	-33	...
19	12.2	29	8.6	22	4	-13	-36	...
20	12.3	29	8.6	22	4	-13	-36	...
21	12.9	28	9.0	23	7	-8	-29	...
22	12.5	24	8.7	19	4	-10	-32	...
23	12.4	19	8.7	15	2	-11	-31	...
24	13.2	15	9.3	14	4	-6	-23	...

Tx : VK SOUTH Rx : Sth Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.6	15	16.6	20	19	14	5	-6
2	20.7	15	17.1	20	19	14	5	-5
3	20.7	16	17.0	21	20	15	5	-5
4	20.6	16	16.9	23	21	15	5	-6
5	20.5	17	16.8	26	22	16	6	-6
6	20.2	19	16.5	30	24	17	6	-7
7	19.7	22	16.0	34	26	17	4	-9
8	18.7	24	15.1	37	26	15	1	-15
9	17.4	26	14.0	36	23	11	-5	-23
10	16.1	27	12.9	34	19	6	-13	-33
11	14.8	28	11.9	31	14	-1	-22	...
12	14.0	29	11.1	29	10	-6	-30	...
13	13.3	30	10.6	26	6	-12	-37	...
14	12.7	31	10.0	24	3	-17	...	...
15	12.2	31	9.5	21	-1	-22	...	...
16	11.6	32	9.0	19	-5	-27	...	...
17	11.1	32	8.5	16	-9	-33	...	...
18	10.7	32	8.1	13	-13	-37	...	...
19	11.3	23	8.4	13	-8	-29	...	...
20	13.0	18	9.7	16	2	-13	-35	...
21	15.7	17	11.9	19	11	1	-15	-33
22	18.1	16	13.9	20	16	9	-3	-17
23	19.6	15	15.3	20	18	12	2	-10
24	20.2	15	16.0	20	18	13	3	-8

Tx : VK WEST Rx : Europe L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.2	-19	7.9	-4	-6	-12	-25	...
2	10.2	-15	7.9	-3	-6	-14	-28	...
3	10.2	-12	7.9	-2	-7	-16	-32	...
4	9.7	-9	7.6	-1	-9	-20	-38	...
5	9.0	-7	7.1	-1	-13	-27	...	...
6	9.1	-2	7.2	-1	-14	-29	...	...
7	10.5	7	8.4	4	-8	-23	...	...
8	13.2	12	10.5	11	2	-9	-25	...
9	16.3	14	13.0	17	11	2	-10	-24
10	16.2	16	12.6	18	12	5	-6	-19
11	13.1	12	10.1	11	3	-6	-21	-38
12	12.6	4	9.7	5	0	-8	-21	-37
13	15.3	2	10.4	0	2	-1	-10	-21
14	14.4	-5	9.8	-6	-1	-4	-11	-21
15	13.7	-11	9.5	-9	-4	-5	-12	-22
16	13.1	-16	8.9	-11	-5	-6	-12	-22
17	12.4	-20	8.5	-12	-5	-6	-13	-22
18	12.0	-23	8.2	-12	-5	-7	-13	-23
19	11.8	-26	8.2	-13	-7	-8	-15	-25
20	12.6	-21	8.7	-13	-5	-6	-12	-21
21	13.5	-16	9.7	-13	-5	-6	-12	-21
22	11.9	-23	9.2	-11	-6	-9	-16	-27
23	11.0	-28	8.5	-11	-8	-13	-23	-36
24	10.4	-26	8.0	-8	-8	-13	-25	-39

Tx : VK SOUTH Rx : Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.5	11	18.0	7	13	12	8	0
2	23.1	11	18.8	5	12	12	8	2
3	23.4	11	19.4	5	12	12	9	3
4	23.5	11	19.4	5	13	13	9	3
5	23.4	11	19.2	7	13	13	9	3
6	23.2	12	19.0	10	15	14	10	3
7	22.8	13	18.6	14	17	15	10	2
8	22.1	15	17.9	20	20	17	10	1
9	20.9	20	17.0	32	26	19	9	-2
10	19.6	22	15.8	34	26	17	5	-9
11	18.2	23	14.6	34	23	12	-2	-18
12	16.8	24	13.4	32	19	7	-10	-28
13	16.0	24	12.7	31	16	3	-16	-36
14	15.3	25	12.1	29	13	-1	-22	...
15	14.7	25	11.6	27	10	-6	-28	...
16	14.0	25	11.0	25	6	-11	-34	...
17	13.4	26	10.4	22	2	-16	...	...
18	12.7	26	9.7	19	-3	-23	...	...
19	12.1	26	9.2	15	-8	-30	...	...
20	11.2	25	8.7	8	-19	...	...	...
21	14.6	20	10.9	21	6	-9	-30	...
22	17.9	15	13.6	19	15	7	-4	-19
23	20.6	13	15.9	14	15	12	4	-5
24	22.0	12	17.3	10	14	13	7	0

Tx : VK SOUTH Rx : USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.0	7	18.8	-7	5	8	7	4
2	22.6	9	17.2	0	9	9	6	0
3	20.4	10	15.5	7	12	10	4	-4
4	18.7	13	14.1	13	13	9	0	-10
5	17.6	16	13.3	19	15	8	-2	-14
6	16.9	19	12.6	23	16	8	-4	-19
7	16.1	23	12.2	27	17	6	-8	-25
8	15.4	25	11.6	28	16	4	-12	-31
9	14.7	26	11.1	28	14	1	-17	-37
10	13.2	28	10.1	25	8	-7	-29	...
11	11.2	30	8.6	17	-3	-23	...	...
12	10.8	30	8.3	15	-6	-27	...	...
13	13.7	28	10.3	26	10	-4	-24	...
14	15.2	26	11.7	29	17	5	-11	-29
15	14.6	20	11.2	21	12	1	-14	-32
16	13.8	12	10.5	12	6	-3	-17	-34
17	13.3	4	10.0	5	2	-5	-18	-33
18	14.0	0	10.4	0	1	-3	-13	-26
19	16.3	0	12.8	-5	1	0	-6	-15
20	19.8	2	14.9	-11	0	2	0	-5
21	22.9	4	17.5	-16	0	4	4	0
22	24.8	5	19.3	-18	-1	4	5	3
23	25.4	6	20.2	-17	0	5	6	4
24	25.9	7	20.7	-13	2	7	8	5

Tx : VK WEST Rx : Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.5	10	8.1	5	-10	-28	...	...
2	9.9	-1	7.6	0	-13	-28	...	...
3	13.1	1	9.7	2	-1	-10	-24	...
4	19.3	6	14.9	0	6	4	-1	-10
5	24.9	7	18.7	-5	6	8	7	2
6	25.2	7	19.9	-8	5	8	8	4
7	25.2	7	20.6	-10	4	7	7	4
8	25.1	7	20.5	-9	4	8	7	4
9	24.6	7	20.1	-7	5	8	7	3
10	23.8	8	19.4	-2	8	9	7	2
11	22.7	10	18.8	4	11	11	7	1
12	21.3	13	17.2	14	16	13	7	-1
13	19.8	17	15.9	24	20	15	5	-5
14	18.5	22	14.7	31	23	14	2	-11
15	17.7	24	14.1	32	22	13	0	-16
16	17.0	25	13.5	32	21	10	-4	-20
17	16.3	26	13.2	32	20	8	-7	-25
18	15.5	26	12.1	31	17	5	-12	-31
19	14.8	27	11.5	29	14	1	-17	-38
20	13.9	27	10.7	26	10	-4	-25	...
21	13.1	28	10.0	24	6	-10	-32	...
22	13.4	28	10.2	25	8	-7	-29	...
23	14.0	26	10.8	25	10	-3	-23	...
24	12.9	20	9.8	16	2	-12	-34	...

Tx : VK SOUTH Rx : Europe L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.6	-8	8.1	0	-4	-13	-28	...
2	10.6	-3	8.2	2	-5	-15	-32	...
3	10.6	1	8.2	3	-5	-17	-36	...
4	10.1	5	7.9	4	-8	-23	...	...
5	9.4	8	7.3	2	-14	-31	...	...
6	9.5	14	7.4	4	-15	-34	...	...
7	11.0	22	8.7	12	-5	-23	...	...
8	13.9	22	11.1	21	9	-4	-22	...
9	17.3	21	12.8	27	18	9	-3	-17
10	14.1	18	10.9	18	10	0	-15	-32
11	12.6	11	9.7	10	3	-6	-22	...
12	14.6	7	10.1	6	5	0	-11	-24
13	13.8	-1	9.8	0	1	-3	-12	-24
14	13.2	-8	9.2	-5	-1	-4	-12	-23
15	12.6	-14	8.8	-7	-2	-5	-12	-23
16	12.2	-18	8.5	-8	-2	-5	-12	-22
17	12.0	-20	8.5	-8	-2	-4	-11	-22
18	12.8	-17	9.1	-10	-3	-4	-10	-19
19	14.6	-12	10.1	-14	-3	-3	-7	-15
20	16.2	-7	12.3	-15	-4	-2	-6	-13
21	14.1	-11	11.0	-10	-2	-3	-9	-18
22	12.4	-13	9.6	-6	-2	-5	-14	-25
23	11.4	-13	8.8	-3	-2	-8	-18	-32
24	10.8	-12	8.3	-1	-3	-10	-23	-39

Tx : VK WEST Rx : Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.3	18	10.0	17	6	-5	-23	...
2	14.4	15	11.0	15	9	0	-13	-29
3	17.0	12	13.4	12	11	6	-3	-15
4	21.4	11	16.4	8	13	11	6	-1
5	23.4	9	17.3	3	11	11	7	1
6	23.4	8	19.2	0	9	10	6	1
7	23.3	8	19.1	-1	8	9	6	0
8	23.2	8	18.9	-1	8	9	6	0
9	22.9	8	18.6	0	9	9	6	0
10	22.2	9	18.0	3	10	9	5	-1
11	21.2	10	17.4	7	12	10	4	-3
12	19.8	12	15.9	12	13	10	2	-7
13	18.2	15	14.6	18	15	9	-1	-13
14	16.7	19	13.3	22	16	7	-6	-21
15	15.7	23	12.5	26	16	5	-10	-28
16	14.9	25	11.8	27	15	2	-15	-34
17	14.2	27	11.5	27	13	-1	-20	...
18	13.6	28	10.6	26	11	-4	-24	...
19	13.1	30	10.1	25	8	-7	-29	...
20	12.5	30	9.5	23	5	-11	-34	...
21	12.2	30	9.2	22	4	-13	-38	...
22	12.8	30	9.6	25	7	-9	-31	...
23	13.3	28	10.2	25	10	-5	-25	...
24	12.7	23	9.7	19	6	-8	-28	...

Tx : VK WEST Rx : Sth Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.6	12	19.6	10	16	15	11	5
2	25.1	12	20.3	10	16	16	12	6
3	25.3	12	18.7	10	17	16	12	6
4	25.3	12	20.8	12	18	17	13	7
5	25.1	13	20.6	15	19	18	13	7
6	25.0	15	20.4	20	22	20	15	7
7	24.6	16	20.0	27	26	22	16	8
8	23.7	19	19.1	34	30	24	16	7
9	22.1	22	17.8	38	31	24	14	3
10	20.4	24	16.4	38	30	22	10	-2
11	18.8	26	15.0	38	28	18	5	-9
12	17.9	27	14.2	37	26	15	1	-14
13	16.9	27	13.4	36	24	12	-3	-20
14	16.1	28	12.7	34	21	9	-7	-25
15	15.4	29	12.2	33	19	6	-11	-31
16	14.8	30	11.5	31	17	3	-15	-35
17	14.1	30	10.8	30	15	0	-19	...
18	13.5	30	10.2	28	12	-3	-24	...
19	13.0	25	9.9	22	8	-6	-27	...
20	13.7	20	10.3	19	9	-3	-21	...
21	16.0	16	12.6	17	12	4	-8	-23
22	19.3	14	14.6	15	15	11	2	-8
23	22.3	13	17.1	13	16	14	8	0
24	24.0	12	18.7	11	16	15	11	4

Tx : VK SOUTH Rx : Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.5	2	8.8	4	-3	-13	-31	...
2	10.8	-7	8.3	0	-5	-15	-31	...
3	14.4	-1	10.7	-2	0	-3	-13	-25
4	21.4	5	16.5	-8	3	5	2	-3
5	25.4	6	20.8	-15	1	6	7	4
6	25.2	6	20.6	-17	0	5	6	3
7	25.1	6	20.5	-17	0	5	6	3
8	24.7	6	20.1	-15	1	5	6	3
9	24.0	7	19.5	-10	3	7	6	3
10	22.8	8	18.5	-3	7	9	7	2
11	21.3	11	17.1	6	12	11	6	0
12	19.7	14	15.7	15	16	12	4	-5
13	18.1	19	14.4	23	18	12	1	-11
14	17.0	23	13.5	30	21	11	-2	-17
15	16.2	25	12.8	30	19	8	-6	-23
16	15.4	26	12.1	30	17	5	-11	-29
17	14.8	27	11.5	29	16	3	-15	-35
18	14.2	28	10.9	28	13	0	-19	...
19	13.5	28	10.3	26	10	-4	-25	...
20	13.1	29	9.9	25	8	-7	-28	...
21	13.9	27	10.4	26	11	-2	-22	...
22	16.1	23	11.9	28	18	7	-7	-23
23	16.0	20	12.3	23	15	7	-6	-21
24	14.3	14	10.8	14	7	-2	-17	-34

Tx : VK WEST Rx : Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.1	14	20.8	15	20	20	16	10
2	26.6	14	21.4	12	19	19	16	11
3	27.5	13	21.0	11	18	19	16	11
4	27.9	13	21.2	10	18	19	17	12
5	28.4	13	21.6	11	19	20	18	13
6	29.3	14	22.3	13	21	21	19	15
7	29.5	15	23.3	17	23	23	21	17
8	28.9	16	23.6	22	26	25	22	17
9	27.8	18	22.6	29	30	27	23	16
10	26.4	21	22.0	41	37	31	24	16
11	25.1	22	20.2	43	36	30	22	13
12	23.5	22	18.9	43	35	28	18	8
13	22.2	23	17.7	42	33	25	15	3
14	21.5	23	17.1	42	32	24	12	0
15	20.8	23	16.5	41	31	22	10	-3
16	20.0	23	16.2	39	29	19	6	-8
17	18.8	24	14.7	37	26	15	1	-15
18	17.7	24	13.8	35	23	11	-5	-23
19	16.4	25	12.6	32	18	4	-14	-35
20	14.0	25	10.8	24	4	-14	-39	...
21	12.6	25	9.8	17	-6	-28	...	...
22	16.3	22	12.7	29	15	2	-16	-37
23	21.7	16	16.7	24	22	17	9	-1
24	25.0	15	19.6	19	22	20	15	8

Tx : VK WEST Rx : USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.2	6	17.5	-14	1	5	5	2
2	20.8	6	15.7	-8	4	6	3	-1
3	18.5	6	13.9	-2	5	5	1	-7
4	16.6	7	12.5	4	7	4	-3	-13
5	15.5	10	11.6	8	8	3	-6	-19
6	14.8	13	11.0	13	9	2	-10	-24
7	14.2	17	10.8	17	10	1	-13	-30
8	13.9	22	10.4	21	11	0	-17	-36
9	13.6	27	10.2	25	12	-1	-20	...
10	12.5	29	9.5	24	7	-8	-30	...
11	10.9	32	8.4	19	-1	-21	...	...
12	10.7	33	8.3	18	-3	-23	...	...
13	13.3	31	9.9	28	12	-2	-23	...
14	16.5	29	13.0	35	24	13	0	-16
15	14.3	25	11.0	25	15	4	-11	-29
16	13.7	18	10.5	18	10	1	-14	-31
17	14.6	12	11.3	12	9	3	-9	-23
18	13.9	5	10.6	6	5	0	-11	-24
19	13.3	-2	10.1	0	2	-2	-11	-24
20	14.0	-5	10.5	-4	1	-1	-8	-19
21	16.3	-2	12.9	-9	0	1	-3	-10
22	19.9	1	15.1	-16	-1	2	2	-2
23	22.9	4	17.6	-20	-2	3	4	2
24	24.6	6	19.2	-19	-1	5	6	4

Club Corner

Barossa Amateur Radio Club Inc

Mt Pleasant Radio Picnic day

The 4th Annual Mt Pleasant Radio Picnic day will be held on Sunday 28th March 1993, from 1000 hours to 1600 hours at the Talunga Park Showgrounds, Mt Pleasant.

A major day with activities to suit everybody is planned, and include transformer throwing competitions, Interclub tug of Wars, raffles with good prizes being donated by the sponsors.

Displays from Dick Smith Electronics, Castrol, Countrywide Mobile Communications, Johnston Electronic & Visual Services, Scout Communications, Lencom Antennas, Codan Pty Ltd, Microwave Developments, WIA Equipment Supplies, Stewart Electronic Components, Royal Flying Doctor Service, OTC Maritime, St John's Ambulance, SA State Emergency Service, SA Country Fire Services, Australian Volunteer Coastguard, ACRM, and WICEN promise to make the Radio Picnic Day one to remember.

Undercover trestle table space is available for display and sales use by individuals and clubs for $5-00 per table. Charity organisations can set up displays free of charge.

On-site catering from The Barbecue Man and Noddy's Soft Whip will available throughout the event.

Further information and table bookings may be obtained from Steve Johnston VK5ZNJ on (08) 287 1061, FAX (08) 287 0422, or the Club Secretary, Steve Bigg VK5BCD on (085) 23 0628 (most evenings).

Steve Johnston VK5ZNJ
President BARC

Coral Coast Amateur Radio Group

Oldest Radio Amateur

One of the group's members is Harry Angel VK4HA, who celebrated his 101st birthday on 14th December 1992. It is believed that Harry is the oldest amateur radio operator in the world, and certainly the oldest WIA member.

Harry suffered a slight misfortune recently, he has had a fall and broke a hip. He is recuperating in Greenslopes Hospital in Brisbane. We all wish Harry a speedy recovery.

The members of the Coral Coast Amateur Radio Group recently celebrated their 25th anniversary, and are still one of the most active groups on the amateur bands. The call signs of the current group are:

VK2

JAIB, AEK, AVO, AVU, AXZ, ETF, FJW, LS, LT, STD.

VK4

AAU, ABD, AGZ, ALC, BET, BHS, BQ, CBP, EF, FUQ, GM, IW, LZ, MU, NN, PO, PZ, RU, SKL, WAM, WB, WK, WKZ, WY, YD, ZB, ZU.

Of the original eight members of the group, only two remain, they are Les VK4LZ and Charlie VK4BQ. The picture shows Les Bell VK4LZ in his shack. Les will be 89 years of age on 28th January 1993.

L E Daniels VK2AXZ

South Coast Amateur Radio Club Inc

The South Coast Amateur Radio Club Inc, based in the southern suburbs of Adelaide, has recently installed a number of new facilities.

The old RTTY repeater VK5RSV which used to be located on O'Halloran Hill has had a facelift, rebuild and relocation to a new site on Willunga Hill. The new site is almost twice as high and, while it is further south of the city than before, it is giving excellent coverage throughout the southern suburbs and Murray Lakes regions. VK5RSV, now licensed as a multimode repeater, is configured as a voice repeater. Allowed modes on the repeater are RTTY, SSTV, FAX, Packet, ASCII as well as Voice. VK5RSV operates on 146.675MHz output and 146.075MHz input. Thanks must go to Bernie VK5ABS for the work he put in rebuilding the repeater.

Also recently recommissioned is the club's Packet/RTTY BBS station VK5TTY on O'Halloran Hill. The Packet and RTTY BBS facilities have spent the past 13 months undergoing a complete overhaul. The Packet 2m frequency is 144.900MHz as before, but the RTTY BBS frequency has changed from being on the VK5RSV repeater frequency to now operating on 147.525MHz simplex. Packet linking to the other BBS systems in Adelaide is in operation via 439.050MHz. This BBS provides a wide range of services including a special BAYCOM program transfer facility, TCPIP networking services and a RTTY to Packet mail gateway. Thanks go to Peter VK5TZX, John VK5KJJ, Darin VK5XDR and all the other people involved in the VK5TTY project for the time and effort put in to get the system back on air.

If you would like to know more about the VK5TTY BBS system send a packet message to VK5ARC@VK5TTY.#ADL.#SA.AUS.OC or by post to the South Coast Amateur Radio Club Inc, PO Box 333, Morphett Vale SA 5161. Finally, by now the VI5VIA special event station commemorating the closure of the Adelaide Coastal Radio Station VIA will have completed its operations. VI5VIA was manned by SCARC members and was heard over the weekend of 29 January to 1 February. The results of this event will hopefully be published next issue. If anyone wishes to contact the South Coast Amateur Radio Club Inc they can either write to the secretary at PO Box 333, Morphett Vale, SA 5161, or come to one of the club meetings. There is a formal meeting once a month on the third Wednesday at 8pm, in the clubrooms at 12 Baden Terrace, O'Sullivans Beach. Informal meetings are held on the other Wednesdays. Foxhunts are also run by the club. Contact us for times and starting locations. The club liaison frequencies on 2m are 147.675MHz Simplex, 146.675MHz repeater VK5RSV and on 70cm 439.675MHz Simplex.

Grant Willis VK5ZWI
Publicity Officer
South Coast ARC Inc

Les Bell VK4LZ, one of the original members of the Coral Coast Amateur Radio Group.

Awards

John Kelleher VK3DP Federal Awards Manager

DXCC Profiles No. 6
Robin Lyon VK6LK

Robin began as an SWL from 1946. He was first licensed in 1951 with the callsign ST2GL, as a member of the Sudan Defence Force.

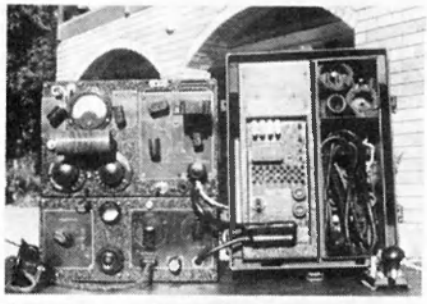
On 20 April 1954, using a B2 suitcase "spy set", he worked G3HDA on 15m. (You may recall from previous DXCC profiles, that G3HDA is now VK6HD). From 1954 to 1956, Robin operated as DL2XR, and during 1958-59 was active from Aden as VS9AH. He moved to Australia in 1970, and was licensed as VK6LK.

His equipment ranged from an FT200 to 1981. Through a TS830S, a Drake C Line (TX4C) and a much modified R4C, in his opinion an outstanding receiver. His present FT-1000 is a luxury, with more features than he can use all at once. His first HF antenna was a TH3 Junior, which was later replaced by a TH6. He had wire antennas for the lower HF bands. He now has a sophisticated array of antennas for all HF bands.

His aim is to work all DXCC countries on 80m. At present, he has 241 confirmed countries on his band.

His advice begins with a cardinal rule — listen, listen and keep on listening. A good DX operator needs patience, perseverance and good operating procedures and manners. His advice also confirms that a properly designed antenna system, and a receiver with a good dynamic range and selectivity, tend to make the job much easier. He also emphasises that a good source of reliable information is essential. Work together with your DX friends, swap and compare information.

NB: In his resume, Robin noted that some operators carry out prolonged QSOs on or near the prescribed DX calling frequencies of 3.795, 7.075, 14.195, 21.295 etc. The one you want could be calling, without success. I join with Robin in condemning the actions of these selfish few.



Type 3 Mark II World War II suitcase transceiver (B2). Output 15 watts CW.

Slovenia (S5, formerly YU3), Croatia (9A, formerly YU2) and Bosnia-Herzegovina (4NA-YU4)

These countries have been added to the DXCC Countries List, following the unanimous voting by the ARRL Awards Committee. The details are contained in the committee's releases dated 25th and 30th November 1992.

Croatia and Slovenia are added for contacts made 26 June 1991 and after. Bosnia-Herzegovina is added for contacts made 15 October 1991 and after. The DXCC desk will now accept cards received at ARRL HQ for updates to ARRL DXCC. For any further information, contact Bill Kennemer K5FUV at ARRL headquarters.

In the past few years there have been several changes to the DXCC countries listings. After the amalgamation of North and South Yemen, 4W was deleted and 7O was installed. Then, with the unification of West and East Germany, the series Y2 to Y9 was deleted. Later, Walvis Bay (ZS9) and Penguin Island (ZS1) were added, making the total 324 countries. With the addition of the above, this total becomes 327 DXCC countries. The deletion of Abu Ail is being considered, after action to de-commission this Red Sea lighthouse. My spies inform me that the wind of change may yet extend to Czechoslovakia — what next!!

The capital cities and geographical coordinates for the new countries are:

S5 — Ljubljana — 46 deg 04 min N, 14 deg 33 min E
9A — Zagreb — 45 deg 50 min N, 16 deg 00 min E
4N4 — Sarajevo — 43 deg 52 min N, 18 deg 26 min E

For those with beam heading programs, please update accordingly.

Looking at the map, the shaded area shows the new DXCC countries. The southernmost portion, YU5/4N5, Macedonia, has not yet been accepted as a separate country.

Robin Lyon VK6LK ar

Pounding Brass

Gilbert Griffith VK3CQ 7 Church Street Bright Vic 3741

This month I wish to repeat some material which appeared in 1988 as there are quite a few newcomers to the ranks of Morsiacs and a number of letters have been arriving lately asking for answers, where the writers concerned did not have access to back-issues of Amateur Radio.

Much of what follows will never be required by the average Amateur and in any case these days in commercial rigs there is usually no method of adjusting many of the parameters we will be discussing.

What we call CW is the most basic form of radio communication. The text books tell us that it is really ICW, interrupted carrier wave. We can split hairs and call it just about anything, after all we are not really interrupting a carrier but sending bits of carrier each time we depress the key.

Modulated carrier wave is another way to send Morse code. The carrier is modulated at an audio frequency of about 800Hz and can be easily heard on an AM type of receiver which does not have a BFO (beat frequency oscillator). Another method is called Frequency Shift Keying where the dot or mark and the space are on different frequencies.

The bandwidth required by a properly keyed signal is quite small, and directly related to the speed of sending. A simple on-off switch will generate a square envelope, together with its harmonics or clicks. You may hear these clicks while tuning in the CW section of the bands and be able to pinpoint the station involved. On the other hand a "soft" dot may be hard to copy, especially at high speed.

There are two main components which affect keying characteristics. Envelope shape, and frequency stability. Any trouble such as key clicks, ripple, chirp, whoop and spacer waves can be attributed to poor conditions in one of these areas. The envelope shape is the outline of the pattern that the signal would display on an oscilloscope. You can imagine that getting the shape right is a difficult thing to do properly, let alone getting it right for a number of different speeds. An unduly "hard" signal will cause

key clicks, which are actually unwanted sidebands, taking up more spectrum space (and power from the intelligent part of the signal).

Chirp is a form of frequency instability which occurs each time the transmitter is keyed, and is recognised by a change in beat frequency at the beginning and end of each character when the signal is monitored on a receiver. It really does sound like a bird's chirp! About the only place you will hear it nowadays is on homebrew equipment controlled by a VFO, (not mine!), and here are three main causes.

1. DC Instability — which occurs when a common power supply is used for the oscillator and the power amplifier. Even the best designed oscillator will require a regulated power supply,or sometimes a separate power supply, to have the stability needed for today's standards.
2. Pulling — refers to the effect on the oscillator frequency of one or more of the subsequent stages whose operating conditions change during the keying cycle. If the stage following the oscillator draws input current or the early stages are tightly coupled, pulling can be expected. If the oscillator is on the same frequency as the power amplifier the likelihood is increased. By careful design it should be possible to short the output of the oscillator chain without shifting the frequency by more than a few hertz. However this sort of dedication is not necessary in a receiver alone.
3. RF Feedback — any high level stray signals leaking back to the oscillator will have an appreciable effect on its frequency, especially if it is a VFO. Isolation of the oscillator is of paramount importance. External feedback is only discovered after the transmitter has been built, and the commonest cause is the power amplifier circuitry being close to the oscillator section. A metal screen is recommended as well as bypassing the HT line to RF by means of series resistance and shunt capacitance. In case you are wondering where I am reading up on all this, let me assure you that I am having ALL the above problems with my QRP gear, so a certain amount or "reading up" is mandatory. I am merely attempting to pass the information along.

All the problems are compounded when attempting a full break-in system (QSK). Not only must the transmitted signal be clean but the receiver must be muted or attenuated in strict timing with the transmitted signal. Slow AGC circuits such as are fitted to most commercial rigs are characterised by their long recovery time, so the receiver will not be able to recover its sensitivity in the spaces between the signal elements. Even the design of the audio section must be carefully considered to prevent the thumps associated with its switching on and off at Morse speeds.

The feature of a full break-in system is that the operator is able to hear incoming signals in between his own dots and dashes. When using QSK the normal changeover and keying functions are controlled by the key, and they must take place in the right sequence. The station must return to the receiving condition at the sensitivity level required by the operator between each dot and dash of the transmitted message. It is not easy to install a good break-in system, one of the problems being that of keying the transmitter oscillator stage. This can be avoided by leaving the oscillator running and screening it so well that it cannot be heard in the station receiver, or using a mixer type VFO with a keyed mixer. It is very difficult to screen the VFO from the station receiver.

If the transmitter oscillator runs continuously it may be audible as a backwave or spacer wave between the keying pulses. A strong backwave may indicate the need for neutralising one or more transmitter stages.

RF envelope shaping can be controlled in different parts of the transmitter by many different keying methods. Because on-off keying is a form of amplitude modulation it generates sidebands whose spacing from the carrier is a function of the keying envelope rise and fall times, which are the highest frequency components of the keying waveform. An untreated keyed waveform looks like square wave modulation, so it consists of the carrier plus all its odd harmonics. The resultant key clicks will extend many kHz either side of the carrier. On the other hand an envelope with a long rise and fall time will sound soft because there is less contrast between the noise and the signal for the ear to respond well at high speeds.

Weighting provides a method of adjusting the overall shape of a string of Morse elements. It can be used to adjust individual element shapes but this is best done in the actual keying circuits of the transmitter. Slow Morse (5-15wpm) can benefit from a heavier weight, ie. the length of the dots and dashes is increased with respect to the spaces between them. This, according to many operators, gives the signal more punch. At higher speeds (25wpm-??) a light weight will give the dots more emphasis, but the conditions must be relatively good for any copying at high speeds. It requires a well based knowledge of keying envelopes just to know which knobs to twiddle if you have the latest in weight controlling keyers! Otherwise you can certainly end up with some interesting effects.

There are many possible methods of keying, and the choice is largely one of practical convenience, personal preference, and suitability to the station as a whole. Almost any stage of the transmitter may be keyed. If the oscillator is keyed, the requirements of a short time constant to reduce chirp and a long time constant to eliminate clicks conflict.

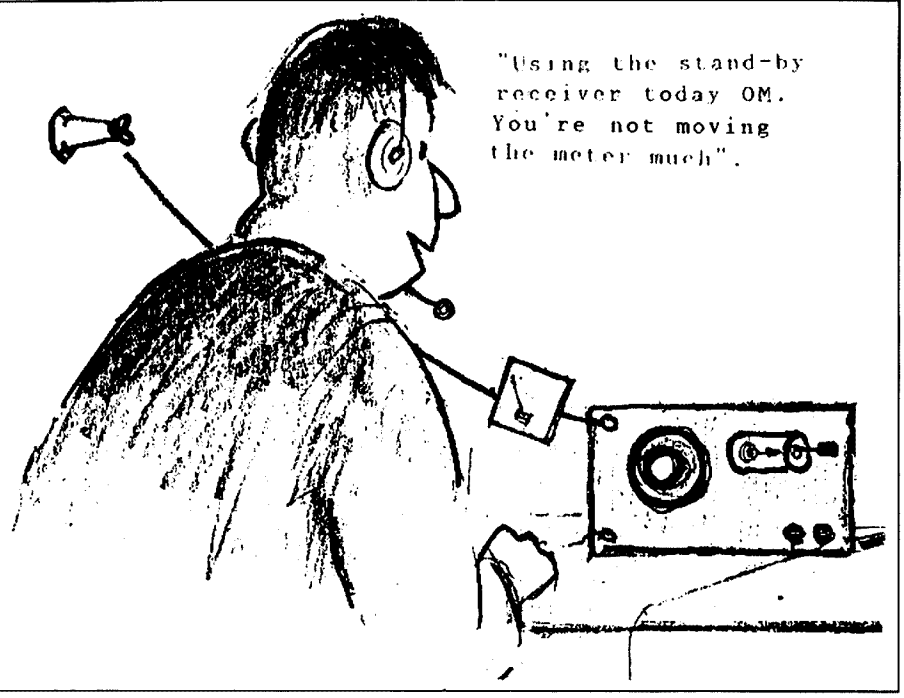
If any stage before the pa is keyed with softening, the pa may harden the keying causing clicks. So keying the pa seems to be preferable. In some cases it is useful to key more than one stage sequentially.

References

RSGB "Radio Communications Handbook" Fifth Edition.

ARRL "The ARRL Handbook" 1986 Edition.

ar



Education Notes

Brenda M Edmonds VK3KT PO Box 445 Blackburn VIC 3130

Book Review NZART Basic Radio Training Manual

As noted in WIANEWS last month, a new edition of the NZART Basic Radio Training Manual has just been released, after having been out of print for some years. NZART is to be congratulated on the revision which has restored a valuable resource to the amateur education scene.

As with earlier editions, the content is set between the standards of the Australian Novice and AOCP examinations. The language and style are equivalent to an average senior secondary school text book. It is perhaps more suited to use as a class text, where the instructor can elaborate or simplify if needed, than as the sole text for a complete beginner. However, a beginner with some background in physics, or even with a friendly amateur to offer assistance, could use this as the main text book.

The new version is very professionally presented, a tribute to the improvements in publishing technology over the last few years. It is of A4 size, with a glossy four-colour cover and binding which should withstand the wear fairly well. The print is clean and of adequate size, even for aging eyes, and the computer drawn diagrams are clear and well labelled.

Of the 25 chapters (130 pages), 16 (90 pages) relate to a syllabus which is very little different from the Australian Novice syllabus, although, strangely, there is no chapter on Interference or on Safety. Information about the examinations, sample questions and a short glossary of terms are separate topics, as are hints on learning Morse code, operating a station and basic calculations.

Information on New Zealand Licence conditions and the roles of the ITU and IARU are also included. The Index is comprehensive, although for many terms only the first reference is noted.

Each chapter begins with a short summary of content and list of Key Words, and ends with a few multichoice revision questions. Terms which are included in the Glossary are underlined the first time they appear in the text.

The text tends to assume prior knowledge in some areas, and also fails to follow-up at times, as in the section on CW transmitters, which states that "The keyed waveform from the transmitter must be shaped to avoid key clicks" but neither defines "key clicks" nor describes key click filters. I was surprised to find that all diagrams show conventional current flow rather than electron flow, and all discussion of HF propagation refers to reflection by the ionosphere rather than refraction.

It is difficult to pick out specific good points when the high standard is consistent. I liked the clear layout of worked problems and examples throughout. The chapter on VHF, UHF and Microwaves I found very well done, as were those on Antennas and Measurement. Frequency modulation is dealt with briefly but adequately. The chapters on Semiconductors and Oscillators reflect the increasing role of solid state circuitry in modern equipment.

It was not until I dredged up the previous edition and compared them, that I realised why the new version seemed to be at a higher level and also less "user-friendly". The earlier edition text was in two-column pages, with the diagrams either one or two columns wide, whereas the new, in three-column format, has most diagrams only one column wide, giving less prominence, in proportion, to the diagrams and more to the text. Also, the new edition has not continued the practice of printing all new terms in bold, which is a distinct advantage when one is seeking a definition or explanation. A further omission is the snippets of history relating the pioneers of electricity to the units named after them.

In all, I have no hesitation in recommending this book for classes for both Novice and AOCP level. I am sure that NZART can look forward to significant sales in Australia. At $A13.00, it compares more than favourably with other current texts and is a welcome addition to the resources available here.

Enquiries regarding purchases may be directed to NZART, PO Box 40 525, Upper Hutt, New Zealand.

The WIA thanks NZART for the review copy.

ar

Technical Correspondence

Warning from AUSTEL

My attention has been drawn to an article "Technical Abstracts: The Iron Glove" which appeared in the November 1992 issue of your magazine.

The article referred to techniques for shielding to reduce telephone RFI. I am disappointed to have to say that I consider the article irresponsible because it is dangerous technical advice and is an encouragement to your readers to be in breach of the Telecommunications Act 1991.

Telephones, as with any equipment connecting to a telecommunications network, must meet AUSTEL's technical standards. A prime objective of this technical regulation is to ensure the equipment is safe for the user. The placing of a "rubber glove filled with steel wool as shielding in a phone" within the enclosure of a telephone outlines a potentially dangerous practice.

In particular the user would face possible lethal consequences if voltage surges including lightning were introduced through the telecommunications lines.

Implementation of your advice would also open your readers to a liability for a penalty of $12,000 under the legislation. Modification of permitted customer equipment such as the TF 200 phone would void the permit status of the phone. Furthermore your reference to RFI suppressed phones and other equipment in the USA was not in the context that connection of such equipment without an AUSTEL permit, denoting that it meets AUSTEL's technical standards, is also illegal with liability for a $12,000 penalty.

Norm O'Doherty
A/g Executive General Manager
Technical Division
Australian Telecommunications Authority
5 Queens Road
Melbourne VIC
(PO Box 7443
St Kilda Road VIC 3004)

Approval for Towers

The Australian Tower Code AS 3995 is due for release early in 1993.

Consequently it is becoming increasingly difficult to get permission to install a tower. This is more so for second hand towers.

If you intend to buy a second hand tower this is what you should do before making a purchase.

First, notify the intended council to find their attitude regarding design acceptance. Some towers were designed to earlier codes, even pre-dating metric units.

Check council's acceptance.

Obtain council inspection prior to dismantle and removal from original site.

The reason for doing all this is that some councils are no longer accepting the old computations.

If this is the case you will have to acquire the services of an engineer to re-work the computations (a very expensive exercise).

Doug Rowe VK3KMN
Nally Radio Towers
46-48 Elliott Road
Dandenong Vic 3175

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE ACT

● KENWOOD TS120V S/N 921679, Linear Amp TL120 S/N 40457, CW filter, mic, cables $600; ROTATOR CDE IV $300; TH3JNR $200; Owen VK1CC QTHR (06) 254 2009.

● FRG8800 Comms rx as new $880 ONO S/N 9E330080; CEdata 1200 bd Hayes compat modems with built-in PSU, new $115 ea; Markus, VK1SK QTHR (06) 231 3373.

FOR SALE NSW

● NALLY 13.7m tilt/over tower in GC, purchaser to dismantle and remove, HY-GAIN 203BA mono band 20m antenna, HAM 2CD44 rotator and control, $1100; Deceased Estate, enquiries to Roily VK2GFO QTHR (044) 74 3361

● DECEASED ESTATE — KENWOOD TS830S S/N 1041997, MC50 desk mic plus hand mic, SP180 ext spkr, 3213.

● COLLINS KWM2A HF txcvr $1,100; COLLINS 30L-1 Linear $900; YAESU FT707 no mobile use, $600; all exc cond, manuals and mics; WIRELESS SET No. 62 MKII HF txcvr $350, VGC; AMPLIFIER RF No 2 MK3 $200; VK2OC (069) 48 5267 after 8.00 pm only.

● 1 only COLLINS mechanical filter, type F455Q7; 1 only COLLINS mechanical filter type F455A-3; offers to Art VK2AS, QTHR (02) 416 7784.

● KENWOOD TS520S xcvr S/N 840611, DG-5 DIGITAL display S/N 730574, MC-35S h/mic, operator and service manuals, original packing, all good cond, $575 ONO; Don VK2MJX QTHR (043) 28 1040.

● YAESU FT301 xcvr S/N 7L171566 with mic and man $450 ONO; GEN COVERAGE Rx DX200, 150 kHz to 30 MHz with digital readout, $150; VK2AIV QTHR (042) 34 1431.

● ROTATOR HAM4, 2 el Q.Quad 10/15/20m, DELTA loop 80/40m, EC; Mark, PO Box 1609, Hornsby NSW 2077.

FOR SALE VIC

● ANTENNAS — HUSTLER 5BTV HF trap vertical, near new; RACK 80/40/20 trap dipole, good cond; TANDY 27 MHz Base stn, unused; any reasonable offer accepted; John VK3BCQ, QTHR, (03) 309 5613.

● ICOM IC751, exec cond with AC PSU, Ian VK3AQU (057) 52 2631.

● KENWOOD TS-430S with AM/CW filters, PS50, SP430, mint cond, $1500; VALVES 2 x 6146Bs, 1 x 12BY7A, Philips, new $100; TINY2 TNC $200, plus RS232 5m cable; MC/50 $85; HI-MOUND HK-702 marble base Morse key $100, manuals, boxes supplied; VK3EPD (059) 83 1771.

● YAESU FL2050 2m linear amp, S/N 11030043, $120 ONO; VHF txcvr ex govt use $50; DICK SMITH UHF 80 ch txcvr, $120 ONO; JIL SX200 scanning monitor rx, $120 ONO; Jim VK3DPO (03) 857 5342.

● ANTENNA TUNER MFJ949D with inbuilt 300w dummy load, new in box, $250 ONO; Damien VK3CDI (054) 27 3121 A Hrs.

● KENWOOD 500 Hz CW filters, suit 850, 930, 940, 950 etc YK88C-1 $50, YG455-1 $120; ICOM SM-6 desk mic $60; HM-12 hand mic $30; Ron VK3OM QTHR (059) 44 3019.

● MULTI BAND inverted vee dipole ant system, four dipoles on single co-ax covering 3.5, 7, 10, 14, 21, 28 MHz with pretuned switchable ATU, complete with 8m telescopic tubular mast, all guys, approx 18m 213 co-ax, easily erected for base or portable op, $250; Lay VK3CF, QTHR (03) 589 4726.

● YAESU FT747GX Ser No 9M250613 gc, $895; FP757HD PSU gc S/N 4I060952, $295; Gordon VK3VFK (050) 21 1452.

● HALLICRAFTERS rx mod S38A, 1.6 — 30 MHz in 4 bands, sep bandspread dial, 5 valves, 110 volt, $250; HEATH HW32 20m xcvr, 200w, single knob tune up, VOX, with AC PSU, good performer, $200; AERIAL TUNER, rotary inductor, tune and load capacitors, co-ax sockets and sep terminals, $200; QRP TRANSMATCH aerial tuner, tapped coil, tune & load caps, $100; ROTARY INDUCTOR, ceramic, strong frame, rotor 3" diam, 6" long, 27 spaced turns of eighth ins, plated copper, $100; ROTARY INDUCTOR with counter, rotor 2.25" diam, 5" long, abt 100 turns of silver wire, $100; TRANSMITTER CAPACITOR 35 to 497pF, CLYDON, good spacing, $60; BENDIX PSU mod MP28B, Ige dynamotor, two 807s, modulator or voltage reg?, aircraft type, $40; RESISTANCE bridge type 551, "Transmission Products" metered, now an antique, $50; VK3DS (053) 32 3226 QTHR.

FOR SALE QLD

● SELL/SWAP HOMEBREW CMOS electronic CW keyer, built-in PS with Galbraith paddle, exc cond, $120, or swap for GDO same cond; Trevor VK4ARB QTHR (07) 269 8848.

● YAESU FT200 xcvr, FP200 PSU, spkr, mic, man, spare finals, valves, relays, ex cond, LICENCED AMATEURS ONLY; Kev VK4SA (075) 94 7369.

● AWA low distortion audio osc, type IA57321 20 Hz to 20 kHz, handbook, $30; Bill VK4WO QTHR.

FOR SALE SA

● KENWOOD station monitor SM220, hardly used, reas offer; MIDLAND CB 27 MHz, Tx/Rx with extras, mag spkr, coax, ant etc, make reas offer; H C Harmer VK5AUS QTHR (08) 344 5011.

FOR SALE WA

● COLLINS linear amp 30-L1 round emblem S/N 41578, incl inst man, 4 extra 811As matched pairs, spare tubes plus auto transformer 250V/230V 4KW rating, package price $1200 ONO; COLLINS S-Line Rx 75-S3B round emblem, instr man, 312-B3 matching spkr, complete set spare tubes, package price $375 ONO; VK6RU QTHR (09) 385 9664.

● ICOM IC551 6m base rig, 10w, SSB/CW, 12v op, memories, $350; ICOM ICAT100 auto tuner $280; Graham VK6RO (09) 451 3561, QTHR.

WANTED ACT

● GDO DM81 or similar. Willing to pay reasonable price; VK1NGD (06) 292 2609.

WANTED NSW

● AVO valve characteristic meter MKIV, early to mid 1960s vintage, Geoff VK2AZT (069) 42 1392 any time.

WANTED VIC

● PRC25 Military TX/RX, pref good cond, Damien VK3CDI (054) 27 3121 A Hrs.

● INFORMATION on Oscilloscope Model 539 by KIKUSUI Co Japan Dist in Aust by Jacoby Mitchell; DATA for RAM I/O Chip Nat No 1NS8154N; KENWOOD ATU Model AT130; Bruce VK3YBW QTHR (03) 527 2661 after 6pm.

● FP757 or similar 12v PSU for FT747, ANTENNA NOISE BRIDGE with reactance scale; 2m H/T "Fancy Facilities Not Essential"; Dr Kevin Johnston, Dept of Anaesthesia, Austin Hospital Heidelberg Vic 3084.

● CIRCUIT DIAG of auto focus board Leitz Pradovit R/RA slide projector; VK3HG, Trevor Starritt, RMB 2340, Tatura Vic 3616 (058) 29 0058.

WANTED QLD

● COLLINS R390 Rx, mains pwr input plug; Lionel VK4NS QTHR

● H E L P! I lost the circuit of EUROPA Transverter I am trying to repair for a fellow Ham, can anyone copy and send to John VK4TL, Box 508 Malanda QLD 4885, tel (070) 96 8328.

WANTED SA

● MANUAL or HANDBOOK for Wayne Kerr Universal Bridge type B221, borrow or buy, all costs met, Kurt VK5KI QTHR (08) 264 1902.

● YAESU FV-707DM Digital VFO; VK5BS (08) 295 3249.

WANTED WA

● PLAYMASTER valve stereo amp, swap for IC202 and FT2FB or cash. (09) 841 8192.

WANTED TAS

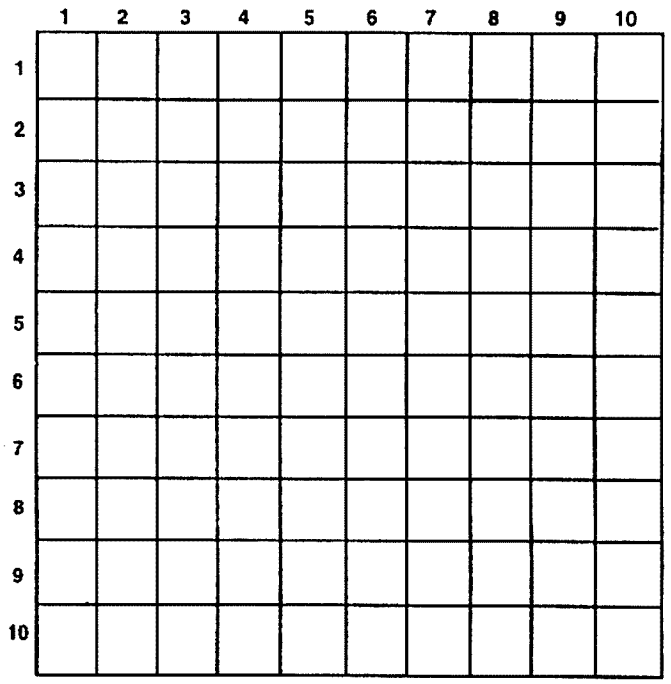
● QUAD HUBS, Planar or Spider, & F/Glass poles 4m long; Brian VK7TA QTHR (002) 34 5562.

MISCELLANEOUS

● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

ar

Morseword 71



© Audrey Ryan 1992

Across:

1 Sketched
2 Caring
3 Warble
4 Huge
5 Insect
6 Green stone
7 Hard metal
8 Division
9 They go with dashes
10 Fright

Down:

1 Cheeky smile
2 Marine animal
3 Endure
4 Fence post
5 Funeral carriage
6 Achieve
7 Perspire
8 Small dessert?
9 Ukrainian city
10 Narrate

Solution Page 64

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

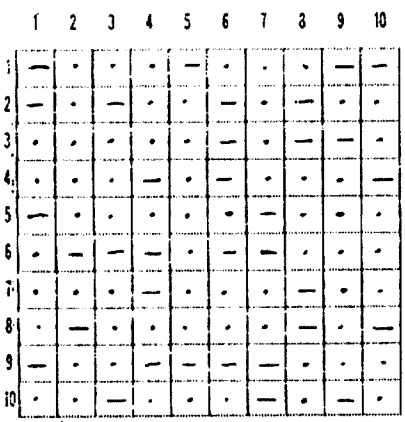
Stats: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

Solution to Morseword No 71

page 63



Solution to Morseword No 71
Across: 1 drew; 2 kind; 3 sing; 4 vast; 5 bitie; 6 jade; 7 steel; 8 rift; 9 dots; 10 fear.
Down: 1 grin; 2 seal; 3 last; 4 stake; 5 bier; 6 attain; 7 sweat; 8 pud; 9 Kiev; 10 tell.

TRADE PRACTICES ACT
It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT
All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING: Industrial Printing, 122 Dover Street, Richmond, 3121, Telephone: 428 2958

MAIL DISTRIBUTION: R L Polk & Co Pty Ltd, 98 Herbert St, Northcote, Vic. 3070, Tel: (03) 482 2255

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 KHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on kHz

VK6RAP Nightly at 2000 local on 146 700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yoesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

Introductory Price

$399

Cat D-3600

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

Icom's impressive range of receivers lets you listen to more frequencies, across the band and around the world.

Starting with one of the smallest receivers ever produced, the IC-R1 covers 100kHz - 1300MHz (2 ~ 905MHz guaranteed), with AM, FM and Wide FM modes, Dual Frequency Selection and 100 memories.

The IC-R72 receives 30kHz - 30MHz (100 kHZ ~ 30 MHz guaranteed) in SSB, AM and CW modes and comes with numerous impressive features, including Icom's DDS System to improve Carrier to Noise Ratio characteristics and optional FM mode.

IC-R9000

With an Icom receiver, the world is as wide as your band

The mobile IC-R100 is packed with powerful features, and covers the 100kHz - 1800 MHz (500 kHz ~ 1800 MHz guaranteed) range in AM, FM, wide FM modes with multi-function scanning and 100 memories with 20 scan edge channels.

While the IC-R7100 covers from 25 ~ 2000 MHz in SSB, AM, FM, wide FM modes, optional TV and FM stereo adaptor, with 900 memory channels, sophisticated timer functions and multiple scan functions.

The top of the range IC-R9000 expands your listening horizons, covering 100 kHz ~ 1999.8 MHz in all modes and featuring Icom's unique CRT display, intelligent scan functions and an amazing 1000 memory channels, in a unit that delivers superb high frequency stability, even in the GHz range.

So tune in to the ones that professional listeners use, from the wide range of Icom wide band receivers.

IC-R7100

IC-R100

IC-R72

IC-R1

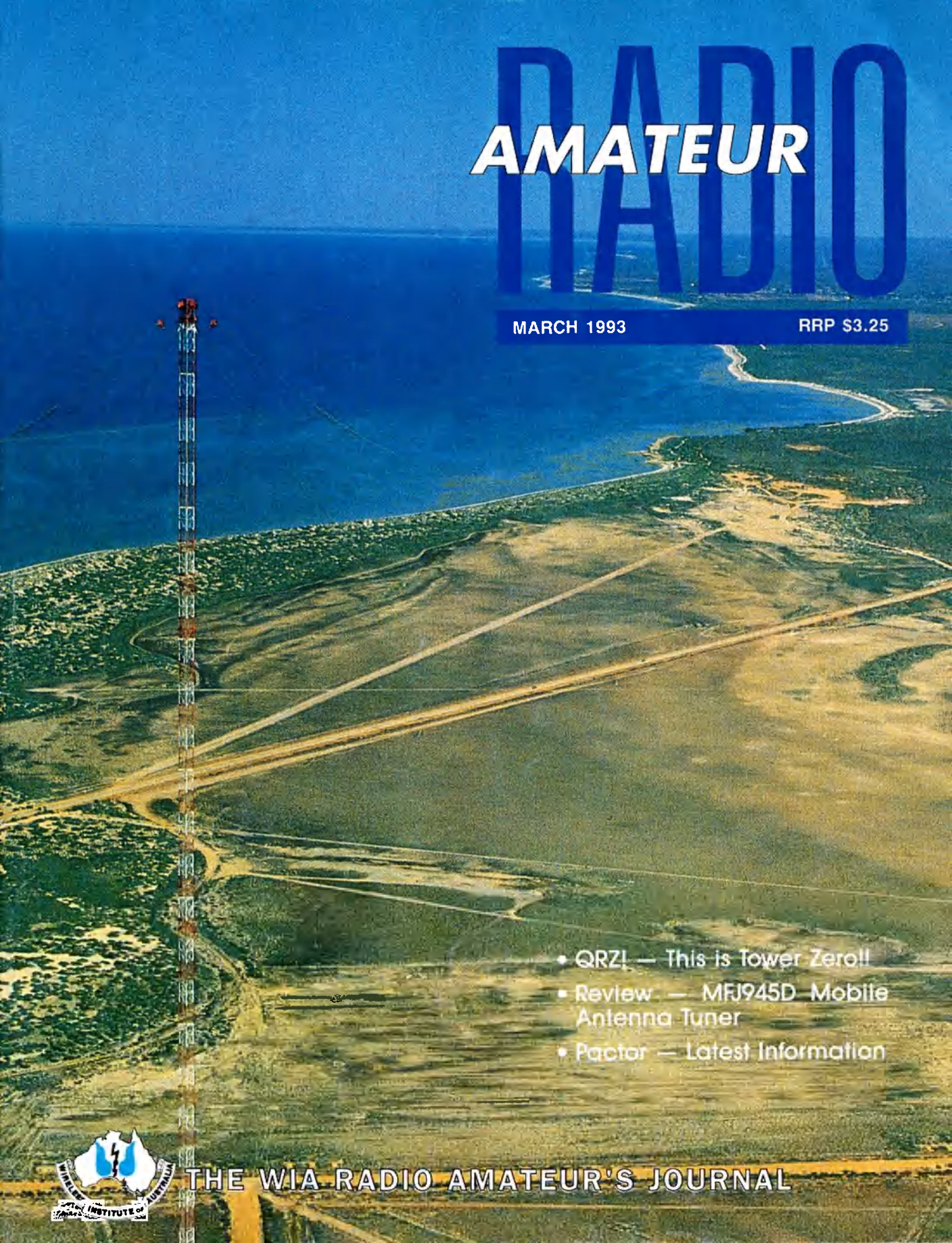
For further information call free on (008) 338 915
or write to Reply Paid 1009 Icom Australia Pty Ltd
P. O. Box 1162 Windsor Victoria 3181
Telephone (03) 529 7582 A.C.N. 006 092 575

ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.

L L. BROWN ADVERTISING 3907

RADIO AMATEUR

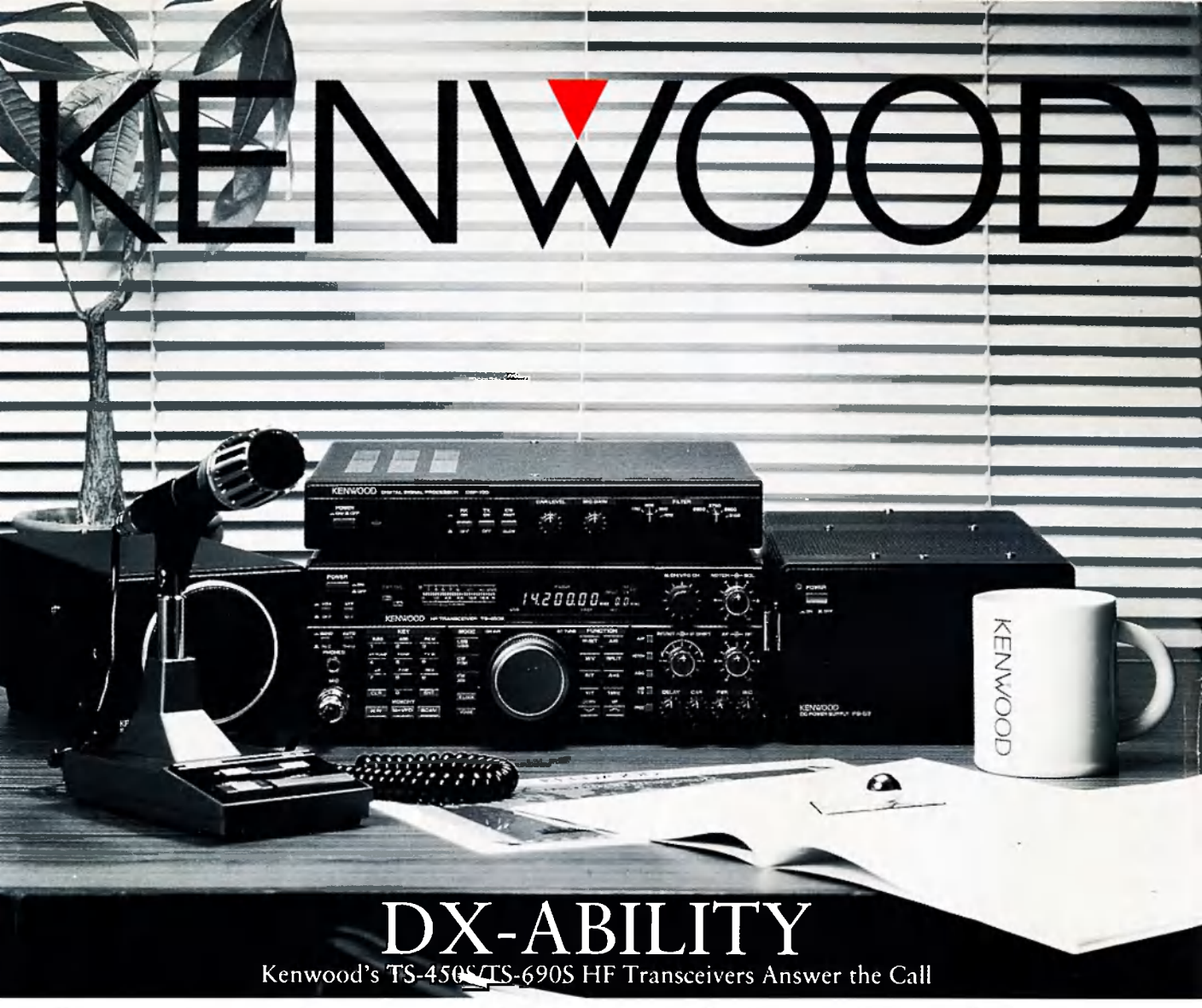
MARCH 1993 RRP $3.25



- QRZ! — This is Tower Zero!!
- Review — MFJ945D Mobile Antenna Tuner
- Pactor — Latest Information

THE WIA RADIO AMATEUR'S JOURNAL

KENWOOD



DX-ABILITY

Kenwood's TS-450S/TS-690S HF Transceivers Answer the Call

Wherever you are, whatever the situation, you can always count on Kenwood's TS-450S and TS-690S for tough, dependable performance. Products of world-famous Kenwood engineering, these versatile HF transceivers are designed for SSB, CW, AM, FM and FSK modes of operation on all Amateur bands, including the WARC bands. To further enhance capabilities, choose the optional DSP-100 Digital Signal Processor. The AT-450 Automatic Antenna Tuner is built into the TS-450S, and is available as an internal option for the TS-690S. Along with multi-function operation and the highest levels of quality and performance, both models offer yet another advantage: ultra-compact dimensions ideal for DXpeditions and mobile use.

Enjoy all the advantages of these superior features:

■ Superior receiver dynamic range of 108dB ■ Kenwood's exclusive AIP (Advanced Intercept Point) system ■ General coverage receiver ■ Automatic antenna tuner (TS-450S only) ■ Inbuilt automatic ATU option (TS-690S only) ■ Ultra-compact design ■ Excellent split frequency operation ■ CW pitch and CW reverse mode selection ■ Digital bar meter and multi-function LCD display ■ IF shift circuit ■ Dual-mode noise blanker (pulse or 'woodpecker') ■ 1Hz fine tuning ■ 100 memory channels ■ 100 watts output on all HF bands ■ 50 watts output on 50 to 54 MHz six metre band (TS-690S only)

HF TRANSCEIVER **TS-450S/TS-690S** HF TRANSCEIVER

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(INCORPORATED IN N.S.W.)

8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140
Phone (02) 746 1519, (02) 746 1888, Fax (02) 746 1509
Call now for further information and the name of your nearest authorised Kenwood dealer.

Kenwood Electronics Australia Pty Ltd only warrants products purchased from their authorised Australian dealers.

Please phone, mail or fax for information
Name.....
Address.....
..... Postcode.....
Publication..... Issue .....
Model.....

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 3 ISSN 0002-6859 March 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Margaret Allen
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 930 am to 3 pm weekdays

Deadlines	Editorial	Hamads
April	8/3/93	10/3/93
May	12/4/93	14/4/93
June	10/5/93	12/5/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover
A view taken from the top of Tower Zero in the Exmouth Gulf, North-Western Australia, looking North. Tower Zero is 396 metres high, and amateur repeater VK6REX is located on top of the tower. It provides coverage to a broad coastal area, and with ducting is workable in Perth. Please refer to the article "QRZ! This is Ed" on page 10.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service
Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Ron Henderson	VK1RH
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Ksilehor	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3ZJC
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawaila	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
WARC & CCIR	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Editor's Comment

Bill Rice VK3ABP
Editor

So Much to Do, So little Time

The title above is a very common complaint around your Editor's QTH. Even though (theoretically) I retired from full-time work nearly six years ago, like most retirees I still wonder how "I ever had the time to go to work"! I don't want to bore you with an account of all that needs doing, but you may be interested in some of the items for AR which (hopefully) will be written in the next few months.

A few weeks ago the opportunity came my way to acquire some current information about Australia's Over the Horizon Radar, Jindalee. This system is to become operational in about three years' time from two stations, one near Longreach, the other near Laverton in WA.

As we well know from our experience with the infamous "Russian Woodpecker", now obsolete and gone, it is possible for an OTHR to interfere intolerably with communications, not only by amateurs. It is also possible, by clever techniques, for an OTHR to co-exist with other spectrum users and barely be noticeable. How the designers of Jindalee have tackled this and other problems will be the topic of the article.

We last had an article on Jindalee by Ian Hunt VK5QX back in April 1985. Much more can now be said than was then possible, so I'm looking forward to writing the story as much as you are to reading it.

I noticed in that same issue (April 1985) that my editorial was one of those "stick the neck out and risk it" efforts, looking forward to 2060 and entitled "Crystal Ball". In 2060 the WIA will be 150 years old, presuming that it, amateur radio, or civilisation as we know it still exists! One of my rash predictions was that by then "we may have begun to cool the climate of Venus". In the latest "National Geographic" there is a magnificent article about Venus with many marvellous "photographs" of its surface.

They are actually radar pictures taken by the Venus-orbiting satellite "Magellan" over a two year period. The Venusian atmosphere is not only so thick as to be largely opaque to light, but is also mostly composed of sulphuric acid! Perhaps I was a little optimistic! Is there a market for gigatonnes of sulphuric acid?

Returning to Earth, Ron VK3OM and I hope eventually to tell you about our trip last year to Far North Queensland, the Top End, and the Centre. And then there's the story about XYL and I visiting Indonesia last September/October. And right now there's a boat to prepare for the annual "Marlay Madness". See you later, folks, there's work to do!

ar

WIA News

From the WIA Federal Office

New Regs "Real Soon Now"

It is expected that news of final proposals for the new Amateur Regulations will be available within the next two months.

This was conveyed in a letter from the Assistant Secretary of The Department of Transport and Communications, Radiocommunications Operations Branch, Gwen Andrews, who wrote to the WIA's general manager on the 1st of February.

The new Radiocommunications Act passed through parliament in November last year, one of the consequences of which is the establishment of the Spectrum Management Agency (SMA), planned for 1st July this year.

Part of this process involves the changes to the Amateur Regulations foreshadowed in a speech given before the SEANET Convention in Darwin on Saturday night 31st October by the Honourable Warren Snowden MP, standing in for the Minister for Transport and Communications, Senator Bob Collins.

In her letter, Gwen Andrews indicates that the final proposals on the Amateur Regulations are being reviewed by senior management right now.

She says that the situation leading up to the introduction of new legislation precludes the new arrangements being introduced earlier.

As the proposals represent a significant deregulation of the Amateur Service, she expresses the hope that they will be worth waiting for.

Telecom Passes Buck on Phone Interference

If you, as a radio amateur, cause interference to a neighbour's telephone, then it's your fault, not the telephone's — that's Telecom policy.

And if the problem can't be readily fixed by a Telecom technician swapping the suffering phone for an "EMI resistant" unit, then the suffering neighbour has to pay for any subsequent solution or, failing that, put up with the interference. That's Telecom policy.

On investigating telephone interference problems, once it has been proved that the

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Divsion, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Tony Ryeland Bob Lloyd Jones Bob Taylor Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 685 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Halley Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV
VK4	Queensland Division GPO Box 636 Brisbane QLD 4001 Phone (07) 264 9075	President Secretary Treasurer	John Aarsse Ken Ayers David Travis	VK4QA VK4KD VK4ATR
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allen Roland Bruce Bill Wardrop	VK6BJA VK5OU VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 344 5241	President Secretary Treasurer	Cliff Bastin Phil Street Bruce Hedland-Thomas	VK6LZ VK6KS VK6OO
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			

Note: All times am local. All frequencies MHz.

Weekly News Broadcasts		1993 Fees
3.570 MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70 cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI 1.845, 3.595, 7.148*, 10.125, 24,950, 28.320,	(F)	$66.75
52.120, 52,525, 144.120, 147.000, 438.525, 1281.750	(G) (S)	$53.40
(*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5168. Some broadcast text can be found on the Packet network.	(X)	$38.75
1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong,	(F)	$72.00
146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900	(G) (S)	$58.00
FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R)	(X)	$44.00
Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.		
1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970,	(F)	$70.00
28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900	(G) (S)	$66.00
hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(X)	$42.00
1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000	(F)	$70.00
147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(	(G) (8)	$56.00
146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV	(X)	$42.00
444.250 Mid North Barossa Valley 146.625, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday		
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560,	(F)	$60.75
7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz.	(G) (8)	$48.60
Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt	(X)	$32.78
William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback		
146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.		
146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on	(F)	$67.00
147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130,	(G) (S)	$53.65
52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(X)	$39.00

Membership Grades

Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times.

interference has been induced into the telephone, *the customer is to be told that the telephone is not faulty.* That's Telecom policy.

Telecom (or AOTC) recently issued its policy on electromagnetic interference (EMI) with regard to telephone maintenance. The policy states that Telecom does not accept that EMI is a fault with the telephone. They identified that EMI includes interference from:

— induced power hum
— radio stations
— ham radio
— CB radio

Hence, amateur radio stations are clearly identified as a source of interference and Telecom staff are told that if interference occurs, *you're* at fault and that's what the customer is to be told.

Clearly, Telecom's policy is in conflict with fact and physics. Does Telecom management not understand the science of cause and effect?

To deal with EMI problems, an "EMI resistant" version of the T200 telephone is available. Telecom's policy is that, in interference cases, these are to replace the first rental phone at no additional cost to customers. If additional rental phones are involved, customers have the choice of paying extra rental for an EMI resistant unit or buying one outright. If the EMI resistant phone doesn't solve the problem, tough — Telecom has no other rental units.

If the EMI problem can't be diagnosed or assessed over the phone (in calls to 1100), customers with EMI problems will be charged service call fees and labour costs to have a technician attend their premises to further assess the problem or replace the unit with an EMI resistant phone.

Customers owning non-Telecom "sale" phones only get 14 days from date of purchase to discover the problem and return the phone for a refund.

It is expected a "sale" version of the EMI resistant T200 telephone will be available in May.

Note that, if you discover your station is causing interference to a telephone, you could run foul of AUSTEL as it is an offence to make unapproved modifications to telephone installations — see *Technical Correspondence,* AR, February 1993, page 61. Penalty, up to $12,000.

Oops! — Feb AR

The "Cover" photo caption on page 1 of the February issue wrongly accredited Musa Manarov with being given Honorary LIFE Membership of the Victorian Division — Musa was actually granted only Honorary Membership.

Amateur Operation on 165-190 kHz

Australian amateurs can conduct experiments on the 165-190 kHz band, by applying for an experimental licence from the Department of Transport and Communications.

In a letter to the general manager of the Federal Office in January, the Director of Licensing Operations, Radio Communications Operations Branch, George McLintock, said that while the Department is not prepared to allow amateurs general access to this band as an automatic component of an amateur licence, they have no objection for experimental use of frequencies within this band, which is allocated to aeronautical radionavigation services.

Amateurs wishing to experiment with radiocommunication on 165-190 kHz should apply to the Department for an experimental licence, which carries an annual fee of $90. Ask for a general application form, RB57. You have to specify the location of the transmitter.

At this stage, the Department will agree to the use of all frequencies within the band on a single experimental licence and will allow automatic renewal, but gives no guarantees on future policy on this.

Mr McLintock noted that no protection is given against any new CAA services in the band.

AUSTEL Investigation

AUSTEL, the Australian Telecommunication Authority, is conducting an investigation into "emerging communication technologies for the delivery of wireless personal communication services" (see *WIANEWS,* February issue, page 4).

They advertised in late January, seeking input from interested parties to determine marketplace development and the implications of these emerging "wireless" (ie, radio) technologies in order to develop policy.

These personal communication services (PCS) include wireless LANs (local area networks) for computer systems (see *WIANEWS* December, page 4), low power voice communication systems, new personal portable telephone systems, etc.

As reported, AUSTEL is due to report to the Minister for Transport and Communication (whoever that may be, following the March election) by mid-year.

Submissions close April 1, so there's still time if you wish to put your bib in. A discussion paper is available from AUSTEL by calling 008 33 5526 or, in Melbourne, 828 7305. A copy has been ordered for dissemination and discussion among Federal Councillors.

Chipmaker Goes for Wireless

National Semiconductor, US-based multinational maker of integrated circuits, has announced that it will develop chips for wireless personal communication service applications.

The company announced it is developing a family of silicon radio frequency (SiRF) ICs for use in wireless computer LANs, personal portable and cellular telephones, wireless telephone switchboards (PABXs), pocket communicators and devices described as "personal digital assistants".

Big money is involved, wireless PCS is booming, world-wide. The value of the market for just the ICs in these devices was worth US$375 million in 1991 and is predicted to reach around US$1 billion by 1996.

JOTA Success

The 1992 Jamboree on the Air (JOTA) scored a variety of notable successes, with high Australian participation compared with other world countries, even though total numbers participating were slightly down compared with 1991.

Over 600 amateur stations participated, involving 1263 amateurs, 19102 Scouts and 8030 guides.

Australian JOTA stations made contact with other JOTA stations in 36 countries around the world, New Zealand topping the tally in number of stations contacted, closely followed by the US and Japan.

JOTA activities scored many publicity successes for both amateur radio and scouting, with media stories

and photographs appearing all round the country.

Thanks to Peter Hughes VK6HU, National Co-ordinator for the 35th Jamboree on the Air.

Special Event Station Scores Well

The Special Event station callsign VI150SYD, obtained as part of the Sesquicentennial Celebrations of the founding of the City of Sydney, made its presence felt in over 160 DXCC countries, recording a total of 6257 contacts.

Eight amateur clubs or groups activated the stations, including the NSW Division on their display at the Australian Broadcasting Commission's "Picnic in the Park" 60th birthday celebrations.

Organised and managed by Stephen Pall VK2PS, NSW Division Special Projects Officer, VI150SYD was heard, seen and worked on CW, SSB, RTTY, packet, FM and ATV on 12 amateur bands from 1800 kHz through 450 MHz. Congratulations to all involved.

Aussies on IARU Council

Three Australian amateurs grace the nine-member Administrative Council of the International Amateur Radio Union (IARU).

They are: Michael Owen VK3KI — Vice President, David Rankin VK3QV/9V1RH — Chairman IARU Region III, and David Wardlaw VK3ADW — Director IARU Region III.

The score for other nations is: W — two, then PA0, G3, HK3 and VE3.

Thanks to Federal Councillor Neil Penfold VK6NE for the information.

ARRL Membership Growing Again

Membership in the ARRL grew 3.5% over 1992, reports *The ARRL Letter* for January 11.

ARRL membership had been declining for some years, as other amateur societies around the world have experienced, but the USA's regulatory authority, the Federal Communications Commission (FCC), recently introduced a number of deregulatory measures and a new licence grade, which met almost instant success.

WIA Policy Revamps

Continuing with publication of the 12 revamped Federal Policy items, commenced in last month's WIA News, this month we present three more, covering affiliated organisations, third party traffic and intruders.

Affiliated Organisations

Under Article 103, Regulation 1:

The Board may accept any duly constituted group, club or organisation as an affiliated organisation (hereafter referred to as an affiliate) which in the judgement of the Board has objects such that:

(a) it allows membership not restricted to persons living in any particular part or parts of Australia: and
(b) it has objects consistent with the objects of the Institute; and
(c) it confers no voting rights or any other rights whatsoever apart form those listed herein: and
(d) that not less than (75%) of the members shall at all times be licensed radio amateurs: and
(e) that not less than (55%) of its members at any time shall be financial

members of a Division of the Institute and resident within Australia.

Under Regulation 2 — an affiliate shall:

(a) pay an annual fee equivalent to an amount not exceeding the Federal element for the ensuing year applicable to the subscription of a full qualification city member.
(b) be entitled for so long as it is affiliated, to the use of the Institute's emblem and the words' Wireless Institute of Australia — affiliated organisation" on its stationery and publications, and shall be entitled to subscribe to one copy of "Amateur Radio" as a direct subscriber: and
(c) submit an annual report including its current membership list not later than one month prior to each Federal Convention.

Under Regulation 3:

An affiliate shall cease to be an affiliated organisation if the annual fee is not paid by the due date or if the Board so directs.

Under Regulation 4:

All applications for affiliation to the Institute shall be made in writing to the Secretary together with a true copy of its Constitution.

Reference: 82.081 Appendix A
Previous version: 82.081 Appendix A
Revised: Jul 92 Board meeting & Oct 92 Board meeting
Adopted at Oct 92 Board meeting.

Third Party Traffic

This Board NOTING:

The ability of the Amateur Radio Service to provide public service through the use of its frequency bands, specialised equipment and knowledge;

the ongoing need to promote the Amateur Radio Service to the general public;

a desire to develop operating skills within the Amateur Radio Service;

the potential for the development of national and international goodwill;

an identified requirement for emergency networks operating in support of official counter disaster agencies;

the right of amateur radio operators to choose whether or not to be involved in such activities;

an extant Council Resolution to seek third party traffic arrangements with;

a. all those countries with whom the USA has TPT arrangements,
b. the United Kingdom, and
c. all countries where Australian forces are located.

RESOLVES to:

support the use of third party traffic handling privileges on all amateur bands and by all interested amateur radio operators;
support the existence of networks for facilitating third party traffic handling;
supports the existence of emergency networks operating in support of official counter disaster agencies;
educate interested members in third party traffic handling techniques, procedures and responsibilities;
continue to pursue the establishment of third party traffic arrangements with countries identified in the Council Resolution.

References: 84.09.16 88.12.14/2 IARU AC Resolution 85-7
Previous version: 82.092/1 Appendix C9
Revised: May 92 & Jul 92 Board meeting
Adopted: Oct 92 Board meeting.

Intruder Watch

This Board OBSERVING:

The presence of unauthorised non-amateur stations in exclusive amateur bands;

under ITU Radio Regulations (342), any administration may assign any frequency providing that no harmful interference is caused to another station operating in conformity with the international Radio Regulations;
the ITU Convention requires all members to take steps to prevent interference;

administrations can only know of interference if it is reported by another administration;

only an administration can complain to another administration about harmful interference being caused to a station licensed by it, by a station of another administration;

despite the "frequency agility" of the amateur service there are many known cases of harmful interference being caused to amateur stations;

if inaccurate or insufficient reports are provided an administration is unlikely to act;

the definition of harmful interference when applied to the amateur service, is interference which seriously degrades, obstructs or repeatedly interrupts amateurs operating in accordance with the regulations;

intruder watching requires a special dedication on the part of the amateur with no expectation of immediate results;

the IARU is examining means of injecting intruder watch reports direct to the ITU to supplement reports to national authorities,
and NOTING IARU Region III policy, namely:

the object of Intruder Watch is to constrain as far as possible the use of amateur bands by stations in derogation of the Table of Frequency Allocations by encouraging national Societies to get their own administrations to act in accordance with the Radio Regulations to seek the cessation of such use, on the basis of the administration's own monitoring, or by the administration in accordance with Radio Regulation No. 1873.

This Board RESOLVES that:
intruder watching is important to the amateur service;
intruder watching in Australia be coordinated by a Federal Intruder Watch coordinator who shall furnish reports to the Region III coordinator and the Australian authorities;

Divisions be exhorted to appoint Divisional Intruder Watch Co-ordinators to promote intruder watching and forward reports to the Federal Co-ordinator;

a standardised reporting format be used by Australian amateurs;

individual watchers be encouraged by such means as Freepost, demonstration tapes, intruder watch nets, broadcast segments, an AR column and Certificates of Merit.

Intensive coordinated campaigns be directed against specific regular intruders.

References: 48/4 83.095/3 Appx B2 84.09.06 85.13.03

Previous version: 83.095/3 Appx B2

Revised Jun 92 & Jul 92 Board meeting
Adopted: Oct 92 Board meeting

ar

Celebrating our 10th Anniversary with a

CASH REBATE OFFER

on selected transceivers and receivers.

Transceivers		Receivers	
IC-2iA	- $80	IC-R1	- $80
IC-P2AT	- $80	IC-R100	- $100
IC-2SRA	- $80	IC-R72A	- $150
IC-728	- $150	IC-R7100	- $200
IC-729	- $150	IC-R9000	- $200

To celebrate our 10th Anniversary we are offering a cash rebate on these selected units purchased between the 15th of February and the 31st of March 1993. Better hurry, an offer this good only comes once every 10 years.

For more information on any of these units, call Icom Australia or visit your nearest authorised Icom dealer. Come and see us at the Gosford Convention on the 28th of February and you can see all these units at the Icom stand.

Conditions

1. Available only through Icom's authorised Australian dealers during period of offer on nominated items.
2. Your authorised dealer will provide you with a rebate claim form which must be returned to Icom Australia with the applicable warranty card to be eligible for our rebate.
3. All claims must be sent to Icom Australia, 7 Duke St, Windsor 3181, before April 15 1993 to be eligible for the rebate.

ICOM

Icom Australia Pty Ltd P. O. Box 1162 Windsor Victoria 3181 Telephone (03) 529 7582
A.C.N. 006 092 575

L L BROWN ADVERTISING 4478

PACTOR — The Magic Successor to RTTY and AMTOR

Colin Richards 9M2CR
73 Jalan Pantai
71000 Port Dickson
Malaysia

The article by Roy Philpott DJ0OW in January (PACTR...Here and Now) was a good introduction to this new digital mode. Colin 9M2CR now takes over the theme in greater detail.

No-one now doubts that HF Packet with its AX.25 protocol was a disaster from day 1. In fairness to the Packet pioneers, the 300-baud HF facility was a frill added to a system that was designed specifically for VHF/UHF. Packet, on HF, was another story. Ionospheric noise ruined the CRC check, multi-path smearing smothered the data bits, and noise plus the "hidden transmitter" syndrome shattered the CSMA notion of multiple-station channels. Yet its very failure served a salutary purpose by triggering serious investigation into other ways of sending data more efficiently in the HF environment. A review of past history could be rewarding.

RTTY has long had its band of devotees, who in an earlier era were fascinated by their mechanical teleprinters — those wondrous assemblages of cams, cranks and coil-springs. In the RTTY fraternity there is still an enduring affection for the old "mills", and to this day many a Creed, a Siemens, or an Olivetti continues to give stalwart if noisy service. Yet RTTY suffers from a number of handicaps on the HF bands. Teleprinters use the ITU 5-unit Telegraph Alphabet No 2 which allows a mere 32 possible combinations, so that only UPPER CASE letters may be used. A Figures/Letters shift had to be provided to cater for the full alphabet, numerals and some punctuation marks.

A second problem with RTTY is that it is asynchronous; a receiving station hasn't the vaguest idea when the next data block will arrive. The RTTY terminal only detects the start of an incoming character when the Mark tone changes to Space. It then clocks the next 5 bits, prints the equivalent character, and waits for the next mark-to-space transition. Unhappily, this may not be a genuine signal but merely some of the noise that afflicts most HF radio paths. The result is a garbled character. The third major drawback of RTTY is that the sending station has no way of knowing whether the receiving station has copied the message correctly — or even whether he has copied it at all. Monitor any RTTY QSO and you will see the sender asking "How did you copy, OM?".

AMTOR to the Rescue

AMTOR marked a giant leap forward for RTTY. Credit for this achievement rests squarely with Peter Martinez G3PLX who developed it from the ship-to-shore TOR (Teleprinting Over Radio) defined in ITU CCIR specification 476-4. AMTOR uses a 7-unit code which gives 128 possible combinations, but only those combinations which give 4 Mark pulses ("1" bits) and 3 Space pulses ("0" bits) are used. There are 35 of these and 32 of them are used for direct translation into the standard teletype alphabet (ITU No.2) — the remaining three being used as operational signals.

To beat the random start-stop of conventional RTTY, AMTOR uses synchronous transmission with a bit rate of 100 baud. The receiving station locks into synchronism with the sender, checks that a received character has four "1" bits and the three "0" bits and prints it out if OK. If not, it sends a QR (request) signal to the sender asking him to repeat that character. Each station is identified by a 4-letter SELCAL derived from its callsign. An AMTOR receiving station standing by on a given QRG automatically responds when someone sends its SELCAL. The Sender knows when the receiving station has locked on and the QSO goes ahead.

AMTOR stations found that they could maintain contact and pass traffic even when conditions were poor, with far fewer errors than on RTTY. QRM or QSB only slowed the traffic rate as the receiving station asked for more repeats (ARQ). At the sending end, the message is "echoed back" precisely as the receiving station gets it, so that the first lesson a new AMTOR operator has to learn is that he need no longer ask "How is the copy?". The copy, in fact, is what he sees on his own display or printer.

Despite these major improvements, AMTOR still has some significant shortcomings. Errors still occur when a random 4/3 block is received and the limitation to UPPER CASE is a han-

dicap. If a shift or unshift signal is not received, letters will be printed out as figures and vice versa which can cause confusion. Moreover, two-thirds of the traffic time is used up by ineffective "overheads" in the system so that eventual traffic flow is slower than the rate that could theoretically be sustained even on noisy HF paths.

Further Improvement

The design of PACTOR was started in 1986 by DF4KV and DL6MAA. It aimed at building on AMTOR's good points but eliminating its defects. Some elements of Packet AX.25 have been utilised in modified form to build a superior AMTOR-type system. PACTOR QSOs are carried out in exactly the same way as AMTOR QSOs — in other words, it is a genuine conversation-style mode, with the sender passing the keyboard over to the receiver at the end of his over, and the receiver later passing it back again. But this time, the full callsign and not a SELCAL is used when calling — thus avoiding ambiguities that can arise in choosing SELCALs. PACTOR continues to use a synchronous system but with a cycle time of more than one second compared with AMTOR's 450 ms. The slower "chirp" and the brief ACK signal are recognisably different from AMTOR's briskly repetitive bursts. PACTOR uses a much longer block with a header, 192 message bits and a 16-bit CRC or Cyclic Redundancy Check. On-line data compression using Huffman encoding speeds up traffic flow during text transmission. PACTOR can handle the full ASCII character set up to Decimal 127 and is capable of sending binary with high accuracy.

It uses a clever system of "Memory-ARQ" whereby blocks damaged by QRM or QRN are re-constructed during ARQ repeats. An automatic speed-change mode enables stations to skip into high-speed 200-baud transmission when the path is favourable, dropping back to 100-baud if difficulties are encountered. The end result is a system that is about twice as fast as AMTOR, with equally good weak-signal response and an accuracy that is in essence, 100 percent!

The great virtue of PACTOR is that it is an up-and-running proven system with thousands of users already on the bands. It is hardly likely to be challenged by commercial systems such as CLOVER which use DSP technology demanding a radio frequency stability of 0.10 Hz! To run PACTOR, you need a small PTC controller (10 x 17 x 4 cm) currently marketed by SCS in Germany at around US$420. This can be driven by any computer terminal or electronic typewriter with a RS-232 port. The PTC unit can be simply strapped to provide Low or High Tones with 200 Hz shift. High Tones using FSK and a CW 500 Hz filter is the recommended set-up in which case the customary 170 Hz shift is entirely acceptable. "Listen" mode is mandatory and is, of course, provided, as is FEC transmission. The PTC PACTOR controller can also run AMTOR or RTTY. If the system is standing by in PACTOR mode, it will automatically switch to AMTOR if called by an AMTOR signal.

Each PTC controller has its own mini-mailbox with a capacity of 21,000 bytes which may be accessed by any calling station. This was originally a PACTOR-only facility but the current firmware (Version 2.0) enables AMTOR callers also to use the mini-mailbox. The inclusion of a mini-mailbox in each terminal could be regarded as encouraging station-to-station contacts, and is likely to appeal to those who regard a mailbox-ridden spectrum as somewhat arid landscape.

The PTC controller keeps its own log, which may be interrogated by a distant station. In practice, especially when used with an imaginative and versatile terminal program such as PT.EXE, it is a delight to use. With the full range of keyboard characters at your finger-tips it is more akin to letter-writing — traffic flowing with remarkable speed and with uncanny accuracy.

The PT.EXE terminal program provides split-screen display with on-line help, word out, word wrap, editing, ASCII file transfer, binary data transfer, robot mode with selectable replies, single-key calling for stations on your own compiled list, incoming/outgoing traffic automatically saved to disk in a buffer file, automatic CQ and a host of other features which make PACTOR a dream mode. Small wonder that PACTOR users regard it as the magic successor to AMTOR!

FOOTNOTE:

(1) Current versions of the firmware (Version 2.0), along with the earlier Version 1.32, enable ARQ contacts to be established over the long path. The cycle time is increased to 1.4 seconds and the pause for controls is long enough for ARQ contacts over 40,000 km. There is a slight reduction (about 10%) in traffic throughput.

(2) Orders for the PTC Controller may be sent to: Specialist Communications Systems GmbH, Rontgenstrasse 36 D-6450 Hanau 1, Germany.
Note: Under recent licensing arrangements by SCS the PTC Controller is also being made by: PacComm Packet Radio Systems Inc, 3652 W Cypress Street, Tampa, FL 33607-4916 USA
SCS Germany is negotiating with Kantronics and AEA to enable these companies to include the Pactor mode in their multi-function units. It is understood that they are concerned to ensure that all new PTC controllers follow strictly the SCS Pactor protocol so that the high reputation of the Pactor mode may be safeguarded. The BMK multy software approach apparently has problems and is not yet approved by SCS GmbH.

(3) The PT.EXE terminal program is available for a donation of USD40, along with a formatted disk and self-addressed envelope sent to: Helga Zielke DL6HAX, Im Winkel 13, D-2055 Dassendorf, Germany.

(4) The GPLX AMTOR mailbox has now been adapted to respond to PACTOR callers; software modifications were made by JA3FJ and JA5TX. GPLX PACTOR mailboxes are already in operation at JA5TX, JA3FJ and 9M2CR in the 14 MHz band.

(5) A full technical description of PACTOR and PTC PACTOR Controller is published in QST QEX Issue 116 October 1991.

ar

QRZ!! This is "Ed"

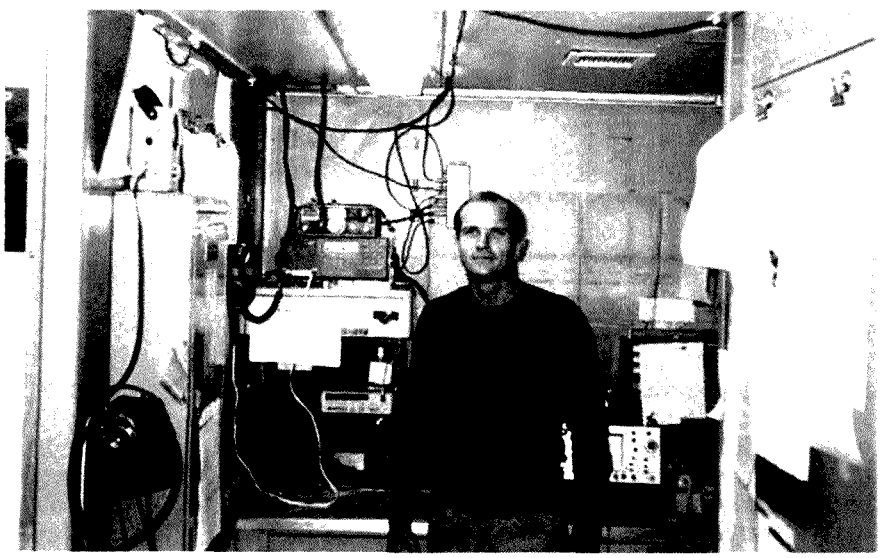
Mal Johnson VK6LC

The following is a short profile of Ed Williams VK6AJR/WB4G/MM/9H3PN when resident at Exmouth Gulf, Western Australia.

Ed is a maritime radio operator and describes the service of amateur radio involving a near shipping crisis when a fire on board caused the ship to become "dead in the water". The support of other amateurs in this event was very interesting. His message is indicative of the present trend to move over to satellite-based communications without having a commercial operator aboard.

Ed's Background

Ed spent 10 years at Exmouth Gulf and worked as a HF technician. He went back to sea two years ago as a commercial radio operator (his past profession). He is very well known in Western Australia, particularly in the north-west region, is a very active SSB/CW operator and home brewer, and took a keen interest in mobile and camping expeditions. Ed was an active member in the North-West Amateur Radio Society, being the custodian of Australia's famous and highest two-metre FM repeater — VK6REX — located on the top of Tower Zero, Exmouth Gulf. In 1984, Ed VK6AJR, VK6ASF and VK6ACT, installed VK6REX on Tower Zero. This repeater was a major link for the distant towns of Port Hedland, Wickham, Dampier and Karratha for communicating with ducting to Perth. Because of its height (396 metres or 1300 feet above ground) it most certainly did cover a large area for mobile stations. VK6REX was taken down two years ago and is presently under renovation and modification. It will be re-installed just out of Exmouth. Ed is a very friendly and hospitable person. He enjoyed helping many amateurs in his area gain their licences and establishing the Exmouth Amateur Radio Club VK6US.



Ed Williams, VK6AJR, WB4GDH/MM in his Maritime Mobile shack.

One of the activities of the club was the Scouting Jamboree on the Air participation. Many amateurs, including myself, had visited Exmouth Gulf and ended up with the hospitality of Ed's fishing and camping techniques at Yardy Creek.

At present, I know of only one active amateur in Exmouth Gulf, and that is Rex Wiggins VK6ARW, who keeps the JOTA going each year and manages the Exmouth Caravan Park. If you ever intend visiting the area, make yourself known to Rex as he is very familiar with all the best DX sites and fishing areas. Rex is very active on Amtor digital modes.

Ed WB4GDH/MM, VK6AJR, 9H3PN is still very active looking for VKs on off-duty hours from his maritime mobile salt mine, so if you hear Ed on the bands, drop in and say hello.

Now, over to Ed for his interesting story.

(Editor's Note: Although this item was submitted over 12 months ago, the message is still relevant today. Apologies for the delay which was caused by extreme pressures for space .. VK3ABP)

"I read with interest the articles in last year's (Dec '90) issue on the problems with the Merchant Marine's Ready Reserve Fleet.

Well, they still have problems with some of them! I am presently the Radio Officer on the SS "Cape Nome" and we have been trying to get home since the end of September.

One successful trip to the Persian Gulf was made at the end of Desert Storm. On the second trip to the Gulf the tailshaft broke about 50 miles south of the Azores. She was towed to Lisbon shipyard where she was worked on for four months. We went on sea trial successfully and were requested to go to Bremerhaven to pick up empty containers bound for the Persian Gulf again! We left Bremerhaven around the second week in October and were about halfway between Sicily and Benghazi when a fire broke out in the port uptake. The fire spread and, finally, the

plant was lost. The emergency diesel was started, but the regulator went bad on it and I could not bring up any of the Marisat or HF gear. By this time the radio room was full of smoke, and the heat from the port uptake was unbearable. (A bar of soap melted in the soap tray in my room). You can imagine what it was like trying to put out the fire, and heat was even worse down in the engine room!

Fortunately, I had my Atlas 210 along, and a 12-volt car battery purchased the last day we were in Germany.

I rigged up a 20-metre vertical dipole on the flying bridge and, within five minutes, contacted 9K2YA (Joseph in Kuwait) who was able to run an emergency phone patch for the captain to the office in Philadelphia. Also standing by on Desert Storm Net was SV1BDC Angelo in Athens.

The office contacted another ship, "Cape Lobos", which was within a few hundred miles of us. The fire was put out successfully that evening and everybody was exhausted! It sure was a strange feeling still to be dead in the water, no power and completely in the dark! The "Cape Lobos" finally got close enough and we rigged the 12-volt battery to the bridge VHF and contacted them on Ch 16.

A tug was called from Malta, and for the next three days, "Cape Lobos" was our relay mainly to MSC in Naples.

The tug arrived two days later and I sent out our routine traffic on 500 kHz using the 40-watt emergency CW transmitter/receiver to 9HD, Malta Radio.

Finally, I would like to add that I hope when the new GMDSS satellite gear is installed on merchant ships around the world they plan to have a radio officer on board just in case something goes wrong!"

ar

WANTED

COVER PHOTOGRAPHS

The Editors are always interested in photographs suitable for use on the cover of Amateur Radio magazine.

Please use recent issues as a guide to suitability.

Mini Equipment Review

Ron Fisher VK3OM

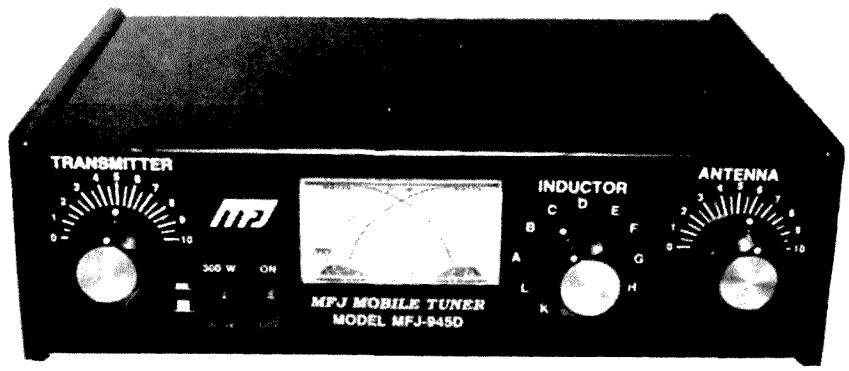
The MFJ-945D Mobile Antenna Tuner

MFJ produces a wide range of excellent antenna tuners. The 945D is typical of the several 300-watt models that Stewart Electronic Components stocks. It is, in fact, the smallest and cheapest of them all, yet it still includes a crossed needle SWR/power meter and 160 to 10-metre coverage. While it's advertised as a "mobile" tuner, it is equally useful in the home station shack.

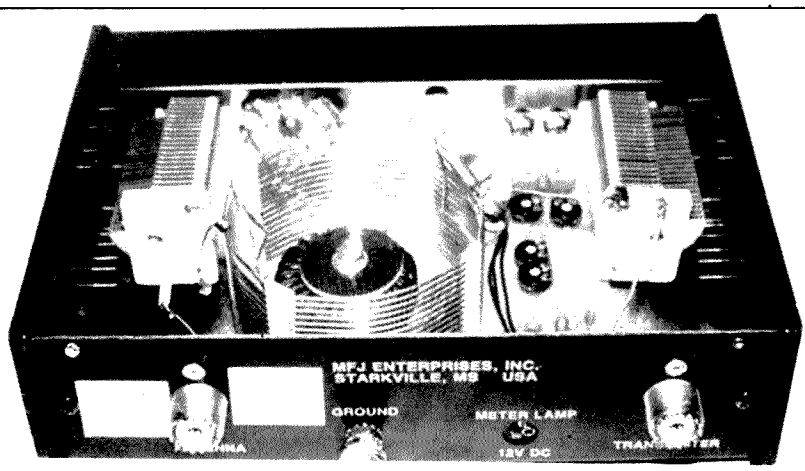
At only $195 it is probably the best value around. Overall size is a compact 200mm wide, 52mm high and 150mm deep. Weight is just 875 grams. Construction of the case and front panel is metal with plastic end pieces to form the rest of the cabinet. Finish is a low gloss black enamel. There are five front panel controls, transmitter (input) and antenna (output) tuning capacitors, a 12-position inductance selector, a push button to select 300 or 30-watt power range on the meter, and a button to switch on the meter illumination lamp. This requires an external 12-volt DC power source.

The rear panel has SO-239 connectors for RF input and output, plus a 2.5mm audio type socket for the meter illumination power output. There is also an earth connector with a good solid wing nut on it. Another word about the cross needle power meter. With the 300-watt range selected, the reflected side reads 60 watts maximum, and with the 30-watt range the reflected full scale is six watts.

So, what will the MFJ-945D do for you? Firstly it will tune up a random wire antenna and present your transceiver with a 50-ohm load. It will extend the useful range of a narrow band antenna such as a trap vertical on 80 metres. It is also ideal to match anten-



The MFJ-945D Mobile Antenna Tuner.



Interior view of the MFJ-945D Mobile Tuner.

nas such as the G5RV on 80 and 40 metres where these usually operate with a high SWR. It should be noted that the 945D does not include a balun, so operation into a balanced line is not possible.

Some of the higher priced MFJ tuners do have a balun built in.

The MFJ-945D on the air

I have given this tuner an extended and very rugged check out. It came along on our 12,000km trip to Darwin and back via the Gulf of Carpentaria. It survived being bounced over terrible roads (in the van, of course), being almost filled with red dust, and didn't miss a beat. At our campsites each night I threw a wire over a suitable tree and got on the air often using frequencies not covered by my mobile whips, such as 30 metres. Results were always excellent, with reliable contacts back to Melbourne, usually a couple of "S" points up on the whip when using 20 metres. At the time, I was unsure of the actual length of the wire. It was just a spare piece in my portable antenna box. On returning home, I checked it out and found it to be just over 80 feet; in other words, a classic W3EDP as described several months ago in Random Radiators. No wonder it worked so well. That's my story, anyhow. The only band the 945D doesn't shine on is 160. The capacitors are too small, and the choice of inductance too limited. It will work on this band, but the matching range is rather limited.

Is there anything I would change on the 945D? Yes, for sure. I would install an insulated terminal in parallel with the output SO-239 to connect a wire antenna. Also, I would like to see a proper DC connector in place of the 2.5mm audio type connector.

The instructions supplied are reasonable. They consist of three pages of A4 size material. There is a circuit included, and they do tell you which side of the DC power connector is positive.

Thanks to Stewart Electronic Components of 44 Stafford Street, Huntingdale, Victoria, for the loan of the MFJ-945D used in our tests. Have a look at the full range of MFJ tuners they stock. I am sure you will find one to suit your needs.

By the way, I might just have to buy a 945D before heading north next year. I am not sure I could get along without it!

ar

Making Simple Circuit Boards

Drew Diamond VK3XU
Gatters Road
Wonga Park Vic 3115.

A simple circuit board production technique which requires no drilling. Components solder directly to tracks and no photographic technique or messy resist is required.

Local and overseas radio/electronics journals periodically show printed circuit "artwork" for projects where the builder has simply etched a board using right-angled copper tracks with rather large pads and runs. The parts are then soldered directly onto the copper pads without need for component holes. The method has several attractive features;

- The amateur can reproduce a project without fancy equipment,
- if lots of ground path and ground-plane is preserved, circuit stability is enhanced,
- any necessary troubleshooting is simplified, as the circuit path is plainly visible to the worker,
- components may be easily replaced without removing the board from the equipment chassis,
- the experimenter can lay out "one off" boards easily,
- with care, the finished result can be quite presentable.

Tools & Materials

Circuit board material — cut to size, roll of wide packing or masking tape, carbon paper, sharp-pointed instrument, retracting type sharp "hobby" knife, perspex ruler, ball point pen, ferric chloride solution, plastic or glass etching container, plastic forceps or tweezers, abrasive pad, circuit board lacquer.

How to Do It

Cover all copper surface(s) with packing tape.

Wrap carbon paper to cover the side to be etched.

Stick the board onto a flat table-top surface, carbon paper upwards.

Use a sharp point to exactly locate a 1:1 copy of the printed circuit artwork pattern over the board- fix in position with tape.

Using a firm pen pressure, trace the pattern onto the board.

Remove the carbon paper to reveal the traced pattern.

Carefully cut along the tracing with a sharp knife.

Remove the narrow tape strips to expose unwanted copper.

Place the board into your ferric chloride solution- pattern upwards. Follow suppliers instructions regarding safety, mixing and disposal of spent solution. The process may be speeded up by placing the etching container into a larger container containing very warm water. Agitate the board periodically. Check often. It should take between 10 and 30 minutes, depending on solution strength, condition and temperature. Use plastic tweezers or forceps to remove the board. Then wash it in running water.

Remove the tapes, revealing the unetched copper tracks.

Polish with an abrasive pad holding the board at the edges to avoid fingerprints, then apply a coat of circuit board lacquer.

Suppliers

(cheapest source first)

Circuit board material; electrical insulating material merchants (eg Menzies Electrical, Melbourne), most electronics parts suppliers (eg Jaycar, Dick Smith, etc).

Ferric chloride; chemical suppliers (eg Selby's) and most electronics suppliers.

Packing or masking tape; paint suppliers, stationers.

Solder-through circuit board lacquer; Jaycar.

Plastic forceps; scientific equipment supplies, photographic suppliers.

Acknowledgments

Garry Newton, VK3DGE- packing tape idea.

Roy Hartkopf, VK3AOH- warm water speed-up.

Further Reading

How to Lay Out RF Circuits, White-G3SEK, Rad Comm Feb/Mar '91.

W1FB's Design Notebook — ARRL.

ar

Build a Packet TNC

Colin MacKinnon VK2DYM
2 Mills Road
Ienhavon NSW 2168

Over in West Australia a few years g some enterprising amateurs signed and produced a kit for a TNC that is software compatible with the world standard TNC2 and its clones.

Several hundred kits have been sold so far and it makes a great and economical project to get started in packet radio. The kit was designed by Joe Nevin, VK6ZTN, and Laurie Dall, VK6XXX, of the West Australian Digital Communications Association and is called the FLASH TNC, model PAD207 Packet Controller.

The bare circuit board is available for $40.00 and the complete kit costs $150.00, both prices including postage. Orders with a cheque can be sent to:- Mr. J. Nevin VK6ZTN, P.O. Box 97, Cannington, W.A. 6107.

I was most impressed by the design which has added features like a prototype area, provision for battery backup and an external modem, and jumper links to re-configure the operating modes. There is even an option to disable the LED indicators if you want to save power. The standard of components is high with all IC's socketed in machined pin IC sockets instead of flimsy stamped pins, and even a blank EPROM is supplied.

The PC board is double sided and screen printed accurately. I costed the components and found I couldn't buy the parts any cheaper here in Sydney. The instructions are good, and the whole thing went together very easily. You need to be able to solder the IC sockets without bridging across to closely spaced adjacent tracks so you need a very small tip soldering iron and fine solder, and just the usual small tools.

The circuit is quite conventional and can be divided into a) a serial interface with a modem, b) a microprocessor control section, and c) a power supply and timer. For the purposes of my description I assume the TNC will be set for 1200 Bd, for VHF packet operation, and a 1200 baud data rate between the TNC and computer. It can however be configured for different modem baud rates down to 300 Bd, suitable for HF packet operation, and communication rates to the computer from 300 Bd up to 38,400 Bd.

The incoming signal from the receiver is input straight into a 7910 modem IC, such as is so often used in packet and telephone modems. The 7910 data signal output is buffered and sent to a Z80 SIO, which transmits the data to the computer in standard DCE RS-232 serial format.

On transmit the incoming data from the computer is sent to the SIO which clocks it out to the 7910 modem where it is converted to the correct modulation frequencies. Transmit level can be adjusted with a trimmer potentiometer. A set of jumper links allows the 7910 to be configured for various modes, but would normally be set for CCITT V.23 back channel loop, which suits the 1200 Bd packet frequencies.

A PTT output is also activated on transmit, using a V10LM switching FET. The FET can handle 15 volts and only a few milliamps when on, which will suit most modern transceivers, but if higher voltage and current is needed to activate the rig's PTT, a small relay will have to be fitted in the line. The interface circuit includes LED indicators for PWR (power on), MODulation, CONnected, STAtus, PTT and DCD (data carrier detect).

The microprocessor is a Z80 driven at about 2.5 MHz by a clock with a crystal on the common frequency of 4.9152 MHz. There is a 32K static CMOS RAM (mine was supplied with a 51256 RAM) and a 32K EPROM to provide the program for the Z80 and TNC functions.

A socket and jumper link is provided to allow for the option of two 16K RAM IC's, and other links to vary the terminal bit rate and modem bit rate. The speed at which the SIO and computer communicate can be set from 300 up to 38,400 baud with these links, whilst the 7910 can be set for baud rates from 300 up to its limit of 1200 Bd, via another set of links.

The power circuit requires a 12 volt DC input and has a reverse voltage protection diode, a 5 volt regulator, filtering and provision for a battery backup. A 555 IC is used to generate -12 volts and -5 volts. The 7805 regulator has a finned heat sink which I had to bend judiciously to clear surrounding components.

Connections to the outside world are via ribbon cable and insulation displacement connectors which are supplied, but as I am running my TNC with a 9600 Bd modem (another project) I used thin shielded cable for the Tx and Rx audio connections.

The instruction manual is detailed, with a complete component check list and a logical assembly procedure as well as troubleshooting hints and jumper configuration options. I did notice that the identification numbers of some capacitors printed on the PC board had been obliterated when the board was drilled, so it is necessary to refer to the PC board layout in the instructions.

A case is not supplied and needs to be at least 180mm long x 110mm wide x 40mm high, preferably metal to reduce the potential for RF feedthrough problems, although I had no problem with the uncased TNC sitting on top of my 2 meter rig. I drilled the front panel of my case (from my junk box) for the LEDS and for an On/Off switch, and filed the bottom edge of the rear panel a little to clear the 3 ribbon cables, and my shielded leads.

Although a 27C256 32K EPROM is supplied, it needs to be programmed, with KISS 1.1.8a or an alternative program. If you can't find a local packet operator with a suitable operating program and access to an EPROM burner, AAPRA at 59 Westbrook Ave., Wahroonga NSW 2076 can supply a

programmed EPROM containing KISS 4 and PMS 3.0 (private mail service) at a cost of $25 including postage, and perhaps other sources are available.

In summary, this is a good, high quality project for getting started on packet. By the time you buy a case, connectors for your transceiver and computer, and perhaps a programmed EPROM, the total cost should still be less than $200.

ar

Technical Correspondence

The Path of Progress

Pervasive technology — a most appropriate description, in this electronic age, of the "survivors" that have passed into general circulation. The questions asked cover a wide field. If an analysis is made of each separate decade in this century, it is like a series of radio "short stories". For the past two decades the equipment market has been driven by the single-mindedness of Japanese industry. The engineering characteristics of this nation are brilliant development, meticulous construction, optimum electrical and physical size and a flair for attractive "gadgetry". This has provided very sophisticated "operator" equipment, at very attractive prices, on the world market, and in this respect the cost-effectiveness is unchallenged.

Much of the spectrum of radio equipment is nearing the technical endpoint in development, and many "improvements" are, in fact, variations on a theme, dictated by the designer's attitude, economy or the actual operating location. Amateurs can suit their own particular situation, but there are limits. The test equipment necessary is often beyond their expertise and purse; what then? A necessary re-assessment of the "intent", was it to produce a particular piece of electronic gear or to achieve some operational need? If the latter, then the hunt is on for an alternative method, and experimental technology comes into its own.

Should commercial gear have more access points for expanding and exploiting the technology within the "box"? Too jolly right it should! It would not be possible to have 100 per cent "technical exposure"; any unit is a series of building blocks, and what is necessary is the ability to intervene between them without compromising the safety or integrity of the equipment, to increase the versatility or to add a specific characteristic to suit an operational test or need. Whether an individual operator makes none or 100 changes is his or her choice. Whether they do them at the start of their involvement, during or after 40 years, is one of the attractions of amateur radio — it is amateur. Leave all the avenues open to be enjoyed.

Robert McGregor VK3XZ
2 Wiltshire Drive
Somerville 3912

ar

Try This

Steve J Mahony VK5AIM
19 Kentish Rd
Elizabeth Downs SA 5113

Amateur Radio Security

Breaking-in to domestic residences is increasing. The amateur shack can easily become a target for these villains, so the amateur should try to make his or her shack and equipment secure.

In my work at a TAFE college, I have recently been involved in making electronic equipment secure, ie laptop computers, cassette recorders and similar easily portable (read stealable) equipment.

This has been achieved with small lightweight stainless steel plastic-coated cables with special lugs attached each end. This cable is passed through lugs and/or saddle-like fixtures attached to the equipment, tables, benches etc. A padlock is then passed through the eye end of the cable, making it difficult — if not impossible — to remove the cable and free the equipment.

This system has stopped the "quick snatch" opportunist thief, as I believe someone with the tools and time could cut through the fittings.

I have linked some of my valuable equipment, and although it is a bit inconvenient to disconnect and move a piece of equipment for testing etc, it is nice to know the gear is secure.

The stainless steel cable used is only about 4mm in diameter, so it's no bigger than the earth wire you should have linking your gear.

This type of securing system is available from several sources. The one I used is called Cabelok LTK-1.0, available from Cecil E Mayo Pty Ltd in each state. A complete kit is $17-95. Padlock extra.

The same system could be used on your TV/VCR, Hi-Fi etc.

Time and money spent on something like this may save you a visit from the hamburglar! Not the variety from the big yellow M store!

ar

Aerial Wires and Spreaders

Robert R McGregor VK3XZ
2 Wiltshire Drive
Somerville Vic 3912

An excellent wire for the long term or span is the copper-clad nickel/steel wire especially made for the job. It is not easy to work with, is expensive, and probably not readily available. Next is a single-strand copper conductor, 1 to 2 mm, which is easy to do anything with, but liable to stretch in long spans and subject to fatigue failure due to flexing in the weather. Multi-strand wire is probably the best compromise. One old imperial 7/029 or in metric 7/0.75 is good all round as it can be used in long spans and tensioned up to reduce excessive sag in 80 m dipoles. For rhombics a 3 mm galvanised wire will suffice and it can be pulled up hard. Additional losses are small and balanced by gain at the hip pocket.

The spreaders for my original Zepp were half-inch (12 mm) hardwood curtain pole, drilled and then soaked in paraffin wax. It is essential to only melt the wax and never boil it, as this destroys its insulating properties. A simple jig to hold the rod whilst drilling will save time, temper and drill bits. Onto a piece of two-inch/50 mm stock long enough for two spreaders nail, glue or staple two pieces of half-inch/12 mm quad with the inner edges adjacent. This is the V block. Mark off the rod. Feed in the first section. Clamp it and drill the holes for the tie wires. Move the rod and repeat until there are enough spreaders. Start again and drill between the two holes already there with a larger size to suit the gauge of feeder wire. Third time through, and now use a tenon or hack saw to halve the larger holes. The spreaders are ready.

I have also used a 10/12 mm grey plastic tubing and no wax. The application of a triangular or rat tail file will customise the end grooves to any feeder changes. For three wire feeders, drill an additional central hole to thread the third wire, a tie every second or third spreader will keep it from sagging. Why three wires? That's another story, later.

ar

Try This

George Cranby VK3QI
PO Box 22, Woodend 3442

Speaker and Headphones Combiner

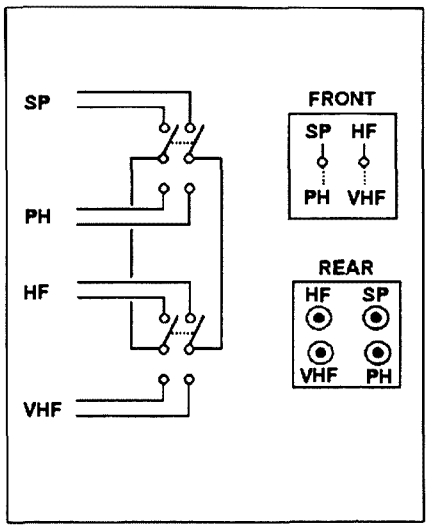
This device enables the use of either one external speaker or one set of headphones for either HF or VHF while both transceivers are operative. It uses the external speaker or headphone sockets of the respective transceivers.

In the SP position, either of the transceivers can be heard on the speaker without touching the volume control of the other one. In the PH position, reception is transferred to the headphones.

With a slight and obvious modification, the headphones can be left connected at all times so the operator can listen on the phones and visitors can hear the speaker. I use this method because I am somewhat hard of hearing.

This device has replaced an earlier one which was published on page 23 of the April 1987 issue of AR.

ar



The Adcock Finder for 10 Metres

Ian Berwick VK3ALZ

Pirates and intruders are a common occurrence on our bands. 10 metres is particularly afflicted. Rather than just sit and complain Ian VK3ALZ did something about it. He built a direction finder to find out where the intruders were. This is Ian's Adcock Direction Finder.

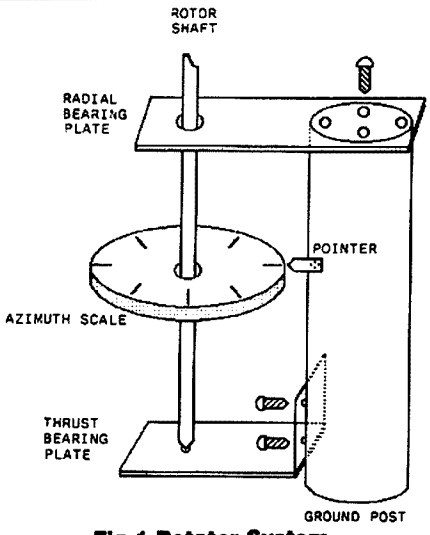


Fig 1 Rotator System

The Adcock Finder for 10 Metres

The drawings should be self explanatory as the theory of the Adcock finder is covered in the ARRL Antenna Handbook and any text on radio direction finding such as Wireless Direction Finding by R Keen. The important thing to remember is that the bearings obtained can be no better than the precision with which the finder is constructed. There is no room for sloppy mechanical work. In operation the listener sits next to the ground post and manually rotates the finder shaft until the aural null is obtained. It is best to wear headphones when nulling the signal. Be wary of signals such as ionospheric forward or back-scatter signals. These give vastly erroneous bearings. Also make sure you are not on a reciprocal bearing. Calibration consists of setting the angular position of the azimuth scale to coincide with the actual bearing in degrees true. Do not use magnetic for bearings. All that is needed is the bearing of a radio point source. When the finder is nulled on the signal undo the grub screw and rotate the pulley so that the scale reading is the same as the known bearing and then re-tighten the grub screw. The scale is now aligned.

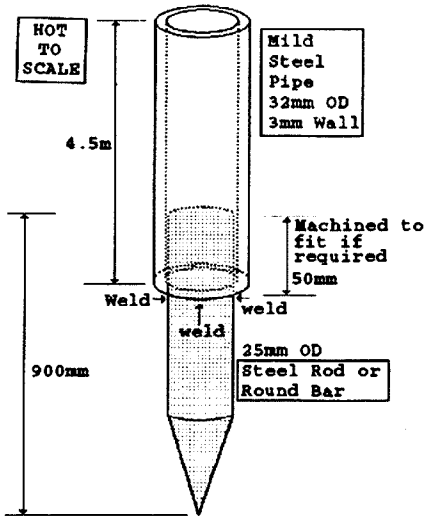


Fig 2 Complete Rotor Shaft Assembly

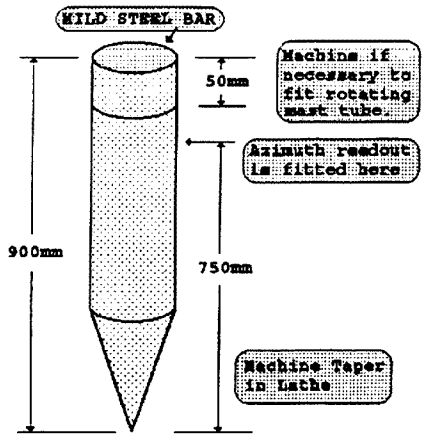


Fig 3 Thrust Bearing Shaft.

If possible select steel rod to fit the end of the pipe (Fig 2). Otherwise machine the steel rod to fit.

Make sure the Thrust Bearing Shaft (Fig 3) bar is straight.

The Radial Bearing (Fig 5) is attached to the top of the Ground Post with coach screws. Use 4 off 50 mm x 6mm dia or 1/4 inch dia.

The Ground Post (Fig 6) should be strong. I used a treated Radiata Pine post 160mm diameter. These come in standard lengths and sizes. Select appropriately. The post should be set in concrete and set vertical with a plumb bob or level before the concrete sets.

In the Azimuth Readout Assembly (Fig 7), glue a 150mm diameter plastic protractor to the top surface with contact cement. Make sure the protractor is properly centred. When the glue has set mount the assembly on the lathe. Make sure it is centred properly on the headstock attachment — chuck etc. Then bore the assembly for the shaft. 25 mm Inside Diameter. 150mm plastic protractors are available at any drawing/drafting supplier. The Radial Bearing is attached to the top of the ground post with coach screws. Make sure the top is flat and level. The thrust bearing is attached to the post near ground level. Make sure the post is flat and vertical at this point. Now to the Rf parts.

The Adcock Antenna elements (Fig 8) are 12.5mm tube. Standard Lengths should be close or you can buy tubing cut to length for a modest charge.

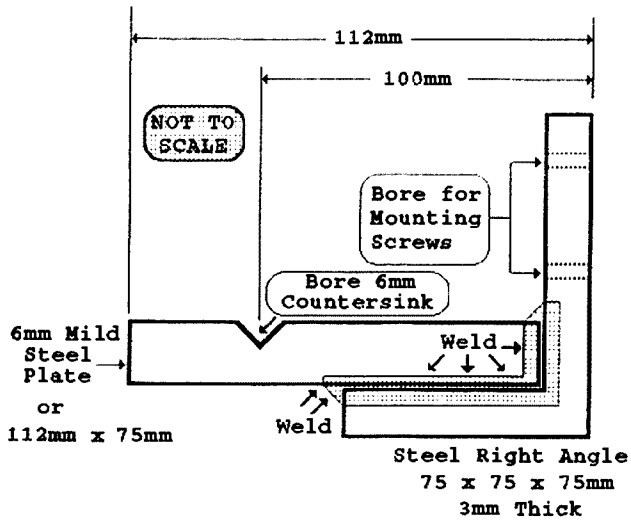


Fig 4 Thrust Bearing Plate Assembly (Elevation)

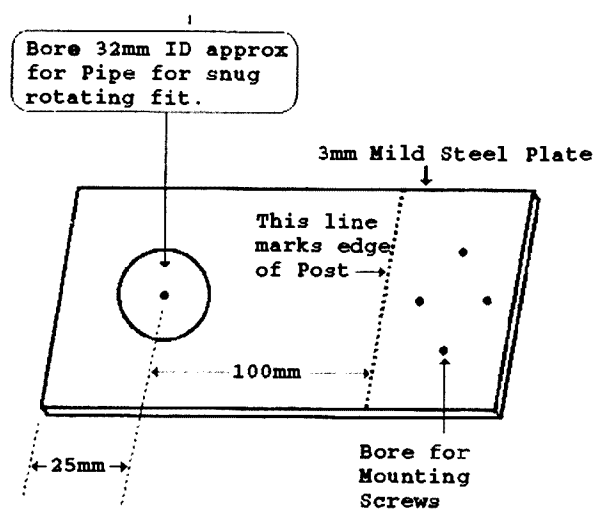


Fig 5 Radial Bearing

In the RF Coupler or Tuner, (Fig 9), the coil is 7 turns wound on 50mm ID. Wire is 12 B&S or 2mm approx bare copper or similar. The link is 2 turns 25mm diameter of the same wire.The link is inside the main coil at the centre. Select taps for best signal. Make sure balance is maintained. Refer to the ARRL Antenna Handbook.

The Antenna Mounting Frame (Fig 11) elements are attached to the frame with plastic tape.

Materials Required

Mild Steel Pipe 32mm OD 3mm wall 4.5m long

Mild Steel Bar or Rod 25mm OD 900mm long

Mild Steel Right Angle 75mm x 75mm x 75mm x 3mm thick

Mild Steel Plate 112mm x 75mm x 6mm thick

Mild Steel Plate 220mm x 75mm x 3mm thick

Radiata Pine 2.4m x 42mm x 19mm 2 off

Radiata Pine 900mm x 42mm x 19mm 2 off

Post Treated Radiata Pine or similar 125mm-150mm OD

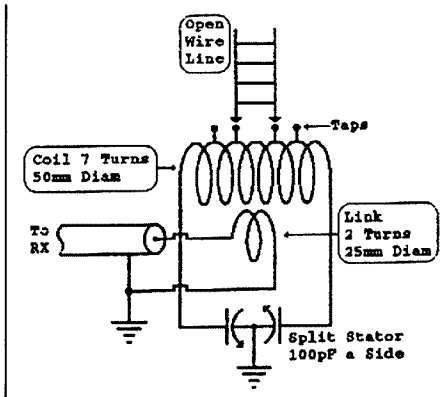


Fig 9 RF Coupler or Tuner

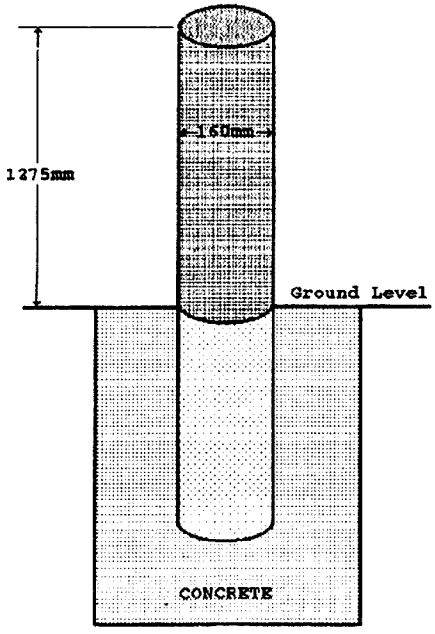


Fig 6 Ground Post

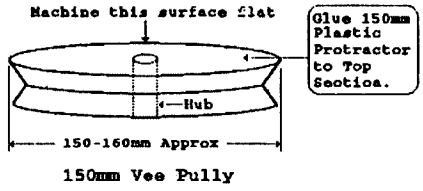


Fig 7 Azimuth Readout Assembly.

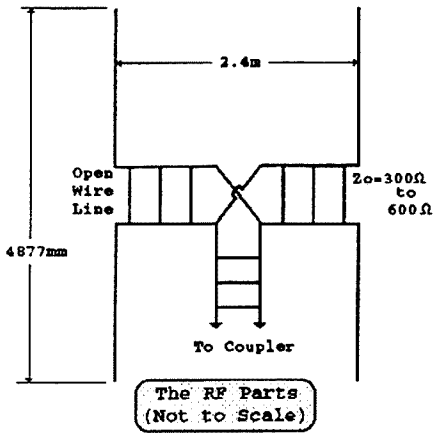


Fig 8 Adcock Antenna

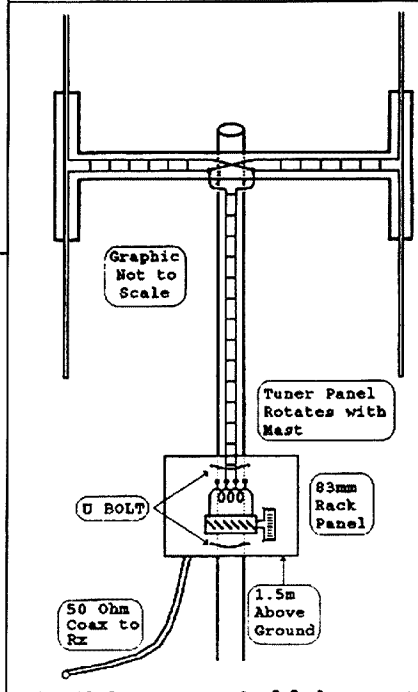


Fig 10 Arrangement of Antenna and Tuner

Coach Bolts 25mm x 6mm or 1/4 inch 4 off

Coach Bolts 50mm x 6mm or 1/4 inch 4 off

Coach Screws 50mm x 6mm or 1/4 inch 8 off

Split Stator Capacitor 50-100pF a side

Standard Rack Panel 19 inch or 483mm or similar

SO239 Panel socket

All quantities 1 off except where stated.

Tech Editors Note

Metric conversion carried out by the Tech Editor. Ian VK3ALZ has imperial size machine tools. Many sizes have near equivalents. Screws and coach bolts have split personality being sold as metric lengths but using whitworth imperial sizes. The important point with this project is to get smooth rotation with no slop. Electrical symmetry is important to achieve good performance.

ar

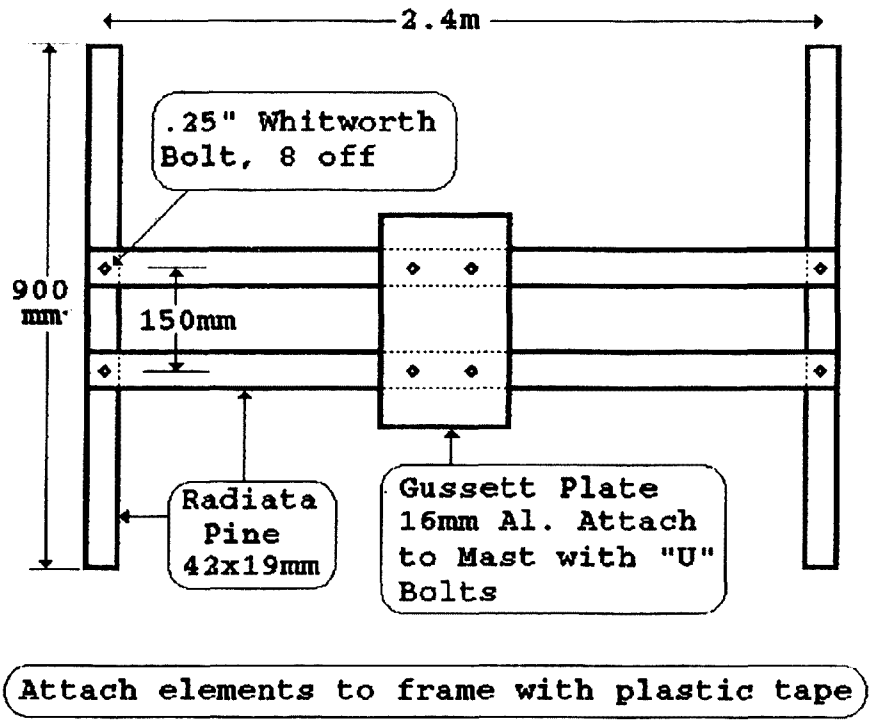


Fig 11 Antenna Mounting Frame

EMC Report

Hans F Ruckert VK2AOU
25 Berrille Rd
Beverly Hills 2209

Telephone susceptibility

1.1 It has been reported that about 300 "modern" telephones had to be replaced by older ones again, because they had to function in several office block buildings near a high power TV transmitter. These telephones had no shielding or filtering of cables, but they contained a variety of semiconductors, which rectified the unwanted signals, having nonlinear properties.

1.2 QST October 1992 published on page 67-69 very detailed information on "telephone interference". If we are not permitted to install bypass capacitors, and if the Telecom organisation is not willing or able to supply a non-susceptible phone, we can only use a common mode ferrite choke by winding the telephone cable through a large ferrite core, using about 10 turns to form a toroid coil where the cable enters the phone. This step could be sufficient if the telephone cable runs underground and not along the power line masts, where a substantial rf voltage may be picked up from our beam antennas.

Powerline RF interference sniffer

2.1 QST September 1992 describes the often experienced problem of rf noise emitted by powerline installations, and a "sniffer" used to locate the source of the interference. The acoustic receiver used by the electricity supplying authority is often not sensitive enough. A portable transistor receiver, especially one with the long wave range 130-330kHz, as used in Europe, can be used for direction finding, having a ferrite antenna built in, and is far more sensitive. One can usually find the general direction from which the noise comes with the shortwave beam antenna. Each rain shower stops the interference, which comes gradually back during the next three days. Rain static is a different story. The engineers from the power authority are usually very co-operative, but they may not have the time to attend, when the conditions are worst. One can see the characteristic interference pattern on a receiver monitor scope. The power poles are all numbered, and the engineers are grateful if we do some preliminary work by identifying the pole with the strongest noise, because in the case of a cracked insulator, a bigger problem could arise for them. The sniffer described in QST operates a receiver at 130MHz, using a three-element beam. The author W3AZ found that at VHF the interference source could be found more precisely.

2.2 QST August 1992, page 49, discussed the question of whether or not a new RF-lightbulb, patented by the "Diable Research Corporation", may cause interference. These highly efficient lightbulbs operate at 13.56MHz. The manufacturer K6KBE says that they are concerned not to cause interference.

3.1 Electro Magnetic Compatibility Law in force!

DL-QTC 12/1992. This law came in force on 13 November 1992 in Germany, and the EMC standards are those which apply to the countries of the European Economic Community. The authorities are to carry out spot tests per manufactured or imported batch of equipment to see that the EMC standards have been met before they grant the CE approval sign by the Federal Office for Post and Communication. Manufacturers and users may be liable for the cost of testing the equipment which is without the CE sign, or when the EMC standards of immunity are not met. Each type of electrical/electronic equipment must be sufficiently immune to unwanted effects (reception etc) of specified signal levels. Customers are therefore asked to check whether the equipment they intend to purchase carries the CE sign. We can only hope it will no longer be economical to produce, sell and import appliances which may be dumped on customers of countries which do not insist on these EMC standards. These EEC EMC standards are better than nothing, but they are not as effective as those applicable in Germany so far, which were developed with strong input by radio amateur EMC experts. It was found, on the other hand, that some manufacturers have been able with economic production methods to achieve EMC properties which are even better than those recommended by radio amateurs. This shows it can be done. It is hoped we in VK-land obtain also the benefit of the EMC efforts, which were carried out in DL-land and its neighbours during the past 20 years.

3.2 RF radiation and the environment

CQ-DL 12/1992 reports the formation of the Research Association Radiation (Funk) comprising representatives from science, commerce, administration, news media and the DARC. The aim of the association is to expand knowledge, to compile and publish the facts on RF radiation and its influence on humans and the environment. As in other areas, here too many wrong concepts are published and sensations are invented under the heading of "electro-smog". The Federal Ministry for Post and Communication met on 2 November 1992 with experts from 17 amateur radio organisations (like Dr Horst Ellering DL9MH, Prof Dr Jodi Elbers DJ3XV etc) to discuss RF radiation and the environment questions. We can claim the fact that RF radiation affects the environment less, the higher our amateur radio antennas are permitted to be installed. **ar**

Working Melbourne from Canberra on 1296MHz

Christopher Davis VK1DO and Geoff Rozenberg VK1CO

Why would anyone in their right mind be interested in 1296MHz? There are only a handful of operators equipped for the band in each capital city, and a few other diehards scattered around. Well, read on, there is enormous interest and reward for efforts on 1296.

I suppose the great attraction to those of us who love antenna experimentation and reaping the benefits of our efforts is that 1296 is the first amateur band where a practically transportable parabolic dish exhibits some monstrous gain. The sort of gain obtainable normally only with a collection of long yagis and associated matching systems.

Having "done" the summer field day with a skeleton slot array on 1296 and being frustrated by a near contact into Wangaratta with Phillip VK3ELV, we were determined to make a better effort for the John Moyle field day, concentrating principally on VHF and UHF. Many discussions and erudite philosophising took place in relation to a better antenna for 1296. Unfortunately, the discussions were reaching lots of agreement, but not resulting in much construction.

The field day approached, and efforts were directed into assisting in equipping another station manned by Rob VK1KRA and Andrew VK1DA who had offered to go into the field elsewhere and increase activity from a site at least 50km distant. This effort was well directed.

However, with minimal spare time, the thought of seriously building four precision yagis and matching systems for 1296 became impossible. Dick VK1ZAH had mentioned some months

before that he had a commercial dish, ex 4GHz satellite, without feed or mounting system, to which we were welcome. With only two days to go, the dish suddenly looked like a more feasible challenge. Dick organised access to the dish which had ended up carefully stored at Tom's VK1BUD QTH. The dish was carefully loaded onto the ute with some additional advice and enthusiastic encouragement from Tom, and we returned to the workshop to scratch our heads.

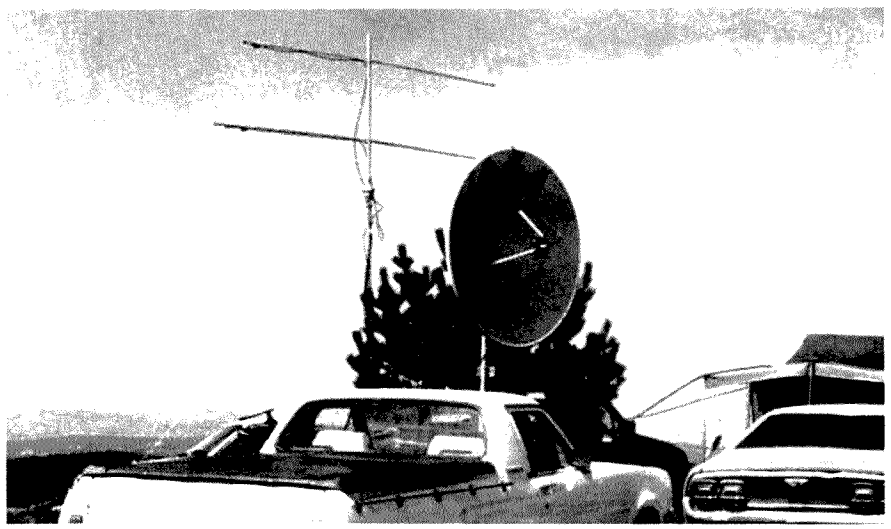
We all understand why a parabolic dish works, but how do you squirt the power into it? This was Thursday night. With only a day to go, and commitments remaining on the Thursday evening, we both agreed to return to the challenge the next morning after reading every chapter in every book which related to dishes and how to feed them.

Well, either great minds think alike, or idiots follow the same path, but our independent reading reached the same conclusions. The profile of the dish was such that typical "coffee can" feeds did not suit this dish. Many pots of tea later, we agreed that a simple dipole with a disc reflector behind it ought to work. That is technical terminology for a piece of PVC pipe with brass dipole elements mounted on the lid of an Arnott's biscuit tin lid. Other brand biscuit tin lids might work, although the results could be crumby!

Assembly of the appropriate baby dipole with a length of 9913 coax feeding it up the PVC tube were found to work according to a field strength meter in the shack. *Care was taken to point the dipole and disc reflector away from our eyes.*

The modified SWR bridge acting as a field strength meter allowed us to observe all those textbook descriptions of how a dipole and reflector behave. The PVC tube connection to the lid was left firm but adjustable to allow for experimentation in spacing when mounted on the dish. Much of the day was then spent creating a feed mount on three aluminium legs to place the feed at the focal point suggested by our calculations. As well, a system of brackets was engineered to hold the dish without stressing its spun aluminium structure while allowing installation of a rotator.

By about three in the afternoon the whole affair was rigged up in the back of Geoff's ute making the front yard look like an outside broadcasting unit. The 1296 MHz receiver was fetched, and the beacon was tuned in. The signal was weak, but copyable. The moment of truth arrived as we turned the rotator. The signal remained consistently weak as the dish turned 180 degrees to point at the local beacon. Suddenly, almost before the rotator could be stopped, the signal went to strength seven and disappeared. Judicious use of rotator control taught us how to allow for inertia and momentum in looking for the obviously narrow dish beamwidth of around nine degrees or so. A quick check with the SWR bridge suggested resonance around 1230MHz.



Field Day site for VK1WI showing 1296 MHz dish, 432 MHz and 144 MHz beams.

After carefully balanced pruning, the whole affair came up to 1296 with the removal of around 3mm on each leg of the baby dipole feed. There was little other testing available to us. Out to the field on Saturday and cross our fingers!

The field station went together smoothly having been regularly rehearsed. The contest got underway with a good range of contacts on 144 and a limited number on 432; however, no sign of even a local on 1296. Our sister station operating on Mt Ginini had flamed out with no 1296 working, and problems on SSB operation on 432. So we crossed our fingers and waited.

At 0750z, Arie VK3AMZ called me on 144.1 with a strength nine signal and exchanged numbers. He then enquired what bands we were running. When he heard we had 1296 he asked us to run a carrier as there was an aircraft in progress right then, which he hoped would enhance the path. His initial attempt to hear us on 1296 was confusing, as our signal peaked strength seven leading him to believe it was a local.

Via 144, Arie then offered to run carrier to allow us to peak the dish, the actual correct heading of which we were only moderately confident. Geoff toggled the controls and obtained a worthwhile gain. I told Arie we were about to transmit on phone. Geoff called him and exchanged reports by 0756z. I then offered to go on CW simply for the exercise. By this time the path was gone. Attempts on 432 were unsuccessful at this time, although 144MHz remained solid, probably via a tropo path.

Another contact with Arie VK3AMZ took place on 1296 at 0125z, with similar results. To give you an idea of how dramatically conditions are able to vary, it took 70 minutes on the Sunday morning to work Lyell VK2BE on 1296. His signal is often strength seven to nine here in Canberra. Two hours were spent with Roger VK3XRS attempting a contact on the Sunday morning; however, even 144MHz was weak at times, with the path on all bands limited to tropo, it seemed.

The callsign used for this first Canberra-to-Melbourne contact was VK1WI; the operator was Geoff VK1CO. The distance from our field station at Kowen Forest to VK3AMZ in Werribee is 456km, which I believe would be a record for VK1. ar

Satellite Gateways

Ron S Graham VK4BRG
Box 323
Sarina QLD 4737

Current, Plus Future Possibilities

The current satellite gateway system serves as an extension of the terrestrial packet bulletin board system (packet BBS). Terrestrial BBS traffic is routed into and out of the gateway. The gateway in turn uploads and downloads the traffic to or from the amateur satellites. The BBS traffic is thus available to similar gateway stations, around the world or interstate, also for two-way exchange with their local terrestrial network. This concept is well accepted and understood by those amateurs who are following current activities in these fields. These gateway stations do a great service in passing BBS traffic over long distances in a minimal time.

Some time ago I had a discussion with a local amateur who was interested in participating in some digital satellite activities. I thought this should really be possible and without him having to set up a satellite-equipped station. Enter a different concept of satellite gateways. One in which a local packet user may directly utilise some of the amateur satellite's functions via a suitably equipped gateway station.

Following is one of the early files describing some of my aims:

This idea of an interactive/real time satellite gateway is offered, at this stage, as a concept, rather than a fully functional system. Others may wish to:

1) implement some of my unfinished facilities;
2) improve on those already implemented;
3) expand the basic concept.

It is not designed to compete with existing gateways, but to offer an alternative, initially experimental, access to some amateur satellites.

It should allow:

1) amateurs to experience some aspects of digital satellite operation with them needing no more equipment than terrestrial packet facilities;
2) those who, for various reasons, cannot install the necessary equipment to work a satellite directly;
3) a low-cost/low-commitment introduction to digital satellites.

The initial aims were to:

a) provide a directory . . . the list of files (messages, bulletins, images, logs etc) currently available from the satellite in question;
b) to be able to read files;
c) to be able to upload files.

Naturally what I thought would be a relatively simple exercise became more and more complex as I delved into the problem. Initially, I could see that some sort of terrestrial BBS could provide a suitable interface between a user and this type of gateway. I decided on the F6FBB BBS as this seemed the most versatile. Setting up that BBS was no small task in itself. Later, I did get to the state of implementing some of the above gateway requirements, albeit, in many respects, rather crudely.

A couple of months ago, in looking through some of the files appearing on UO-22, I noticed that John WA0PTV had put up a suite of programs for beta testing. These programs were designed to, as well as run a normal gateway, do essentially what I had been trying to achieve. I have slowly integrated his work into my system and, at this stage, the whole concept looks quite interesting.

The purpose of these notes is to inform others of these activities. Possibly, the near future will see more of this type of gateway, which John calls a gateway node, being installed by interested amateurs.

The present "state of the art" would allow:

a) a current satellite directory to be circulated as a bulletin or sent to an interested user;
b) the user can request files of interest from that directory. If the gateway station has already downloaded that file, it is immediately available. If the file has not been downloaded, it will be marked for downloading during the next pass in which the gateway participates. The user is sent the file as a BBS message when it is available, or in the case of a binary file, advised, via a message, to use a binary transfer protocol;
c) the user may upload a file;
d) once the system recognises a user, satellite traffic for that user will be automatically downloaded for that user.

All the above is capable of automatic implementation. I have not achieved this as yet! Users, just one or two digipeaters away, should be able to participate. However, the usual terrestrial packet common sense regarding files and binary transfers via a number of digipeaters needs to be considered.

Should sufficient interest be shown, perhaps where more appropriate, that is in larger population centres, some development along these lines may be possible:

a) a dedicated local area network (LAN) could be established for these gateway operations;
b) these LANs could use higher speeds and exist on UHF bands;
c) or, possibly, these LANs could be part of another specialised network and the gateway operations co-existing with other network activities.

Further in the future, we may see some "real time" operation. One can envisage the gateway station established to allow simultaneous traffic between a number of local users and the satellite in question. I feel sure that many other concepts will emerge, and an exciting future lies ahead.

Footnote: Most of the above was covered in a talk given at the Central Queensland Digital Group in Rockhampton on 12 September 1992.

ar

A VHF and UHF Antenna Combiner for Mobile Use

Ian Keenan VK3AYK
6 Pretoria Street
Caulfield South, Vic 3162

These days the use of dual band mobile radios is becoming more popular, due to the flexibility and comparative cost savings by having 2 metres and 70 cm in one "Black Box".

Many of these units have two antenna connectors on the rear of the radio, one for each band. Unless you want your car to resemble a spiny ant-eater, some form of antenna combining is a good idea! On a more serious note, desensitisation or some other form of interaction may become a problem due to the limited horizontal spacing that can be physically achieved between two operating antennas on a vehicle.

To overcome this problem, usually one dual band antenna is employed on the roof of the car. This is fed by coaxial cable, the other end is connected to the antenna combiner at the transceiver.

Commercially made antenna combiners or duplexers are available from the usual amateur radio retailers, but the one described here is much cheaper and will match the performance of these providing there is no significant departure from the construction as described.

Description

The function of the antenna combiner is to provide rejection or isolation of the opposite band in use. This is obtained by developing a high impedance path looking into the opposite ends or ports, ie the VHF and UHF sides of the combiner. This isolation is required to prevent respective transmitters on each band doing damage to the associated receiver of the other band. After all, we want to work dual band without blowing up our receiver front ends!

However, at the same time, a low insertion loss or path is required for either band to the antenna terminal of the combiner.

Looking at the circuit (Figure 1), the operation of the combiner is quite straight forward. There are two discrete filters, one for each band of operation. The outputs of each filter are connected in parallel for connection to the antenna.

Filter 1 is a low pass filter, allowing VHF signals to pass almost unobstructed to the antenna, but providing a high impedance path for any UHF signal.

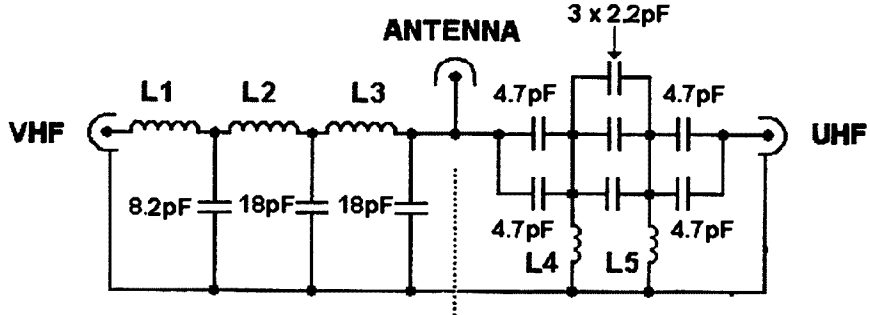
For UHF, filter 2 is a high pass type allowing UHF signals to pass but inhibiting the passage of any VHF energy.

Construction

The device was built into a die cast box approximately 1.5 x 1.25 x 2 inches in size. A small piece of printed circuit board was cut to fit neatly into the bottom of the box. This was then bolted to the bottom of the box. The screw heads were counter-sunk into the box. (I used four 4BA brass nuts and bolts.) The nuts, after being tightened, were then soldered to the circuit board to provide a good electrical earth.

The capacitors and inductors are supported entirely by their own leads. They are soldered directly to each other and to the circuit board where required — no standoffs are used. The inductors should be mounted at right angles to each other. This will significantly reduce mutual coupling and provide greater isolation. I found no shielding partitions were necessary provided this was done. The photograph gives a general idea of the layout and placement of the components.

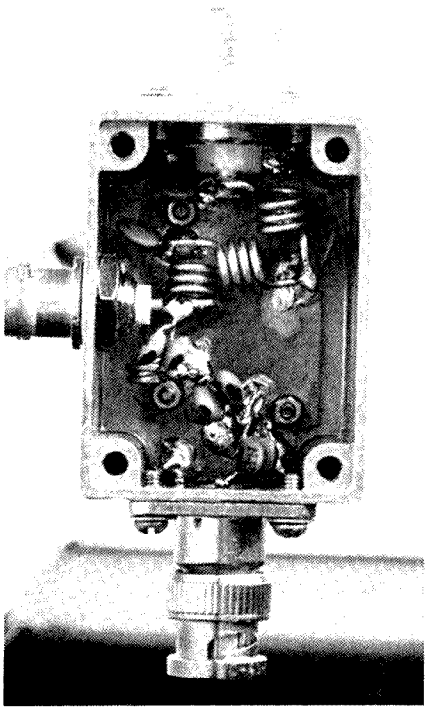
Component details are as indicated in the circuit. For the coils, 18 gauge



Filter 1
L1, L2, L3 - 3.5 turns wound on 5 mm drill bit. Coil length 7 mm.

Filter 2
L4 & L5 - 1 turn wound on 4 mm drill bit. Coil length 5 mm.

Figure 1



The VK3AYK VHF/UHF Antenna Combiner

tinned copper wire was used. All coils are close wound — with sufficient space so adjacent turns do not touch.

It is extremely important that 600 Volt NPO disc ceramic capacitors are used. All component lead lengths (inductors and capacitors) are kept as short as practicable — in effect, just long enough for the components to touch so they can be soldered. Remember, this is a VHF/UHF circuit!

I preferred to use chassis mounted coaxial connectors. This facilitates an easier and more compact unit, as the start of each filter element for both bands can be soldered to the rear of the coax connector. Coaxial cable flying leads could be used (as do the commercial combiners) with suitable holes drilled in the box. The cable braid should be neatly trimmed and tinned, then soldered to the circuit board with suitable coax connectors at the other end for connection to the transceiver. Small standoffs should be used inside the box to support the coax centre conductor where it is attached to the filter components. Keep the leads short!

Testing

Having assembled the unit, now comes the most important part — the testing. On no account should you connect it direct to the radio and try it blind, you made have made a wiring error! Check the unit and observe that all the wiring is correct. If you have access to a sweep generator, operation can easily be verified! The rest of us have to use more mundane methods.

Connect a non reactive 50 watt dummy load to the VHF port at the combiner. Connect a sensitive UHF/VHF power meter terminated in a 50 ohm load to the UHF port. Then connect a 146 MHz power source (transceiver) to the antenna connector of the combiner. Key the transmitter on and read the power on the meter. It should be at least 40 dB down on the VHF power level (ie 40 dB is a power ratio of 10,000 to 1). Therefore, for 50 watts at the antenna port, there should be in the vicinity of 5 milliwatts or less observed on the power meter. If you feel it is necessary, try slightly squeezing or expanding the inductors associated with the high pass filter section to optimise the above figure. I have found that this is not usually necessary.

Next, connect the dummy load to the UHF port of the combiner and the 50 ohm power meter to the VHF port of the combiner. Apply RF power (50 watts) at 440 MHz to the antenna port of the combiner and observe that the power level is at least 40 dB down.

Finally, check the insertion loss. It will probably be around 1 dB. This is done by connecting the power meter to the antenna port and applying a known power level to the appropriate VHF and UHF ports respectively and measuring the result. The loss for a power level of 50 watts should be around 10 watts.

When carrying out all of the above, try placing the lid on the die cast box to make sure there are no violent changes in performance — indicating a possible problem.

Specifications (measured)

Insertion Loss — approx 0.8 to 1 dB (VHF & UHF) to antenna.

Attenuation — 45 dB at 400 MHz for the low pass filter.

— around 44 dB at 149 MHz for high pass filter.

Test instrument used — Wiltron Network Analyser.

Conclusion

Commercial dual band antennas for mobile use are available from the normal outlets around town. To save money and retain what I think is a fairly modest antenna (remember — "she who must be obeyed"), I use a 2 metre quarter wave whip. This whip is harmonically related to the 70cm band and works reasonably well with some compromise in VSWR.

I have found no adverse effects using this homebrew combiner. RF power levels of 50 watts should not be exceeded. The unit has been running now for a number of months with no sign of problems. Remember to exercise EXTREME CARE when building and testing this project. If you are unsure of its operation during the testing phase, seek out help rather than have your receiver front end replaced at the factory.

By way of interest, it should be noted that this combiner can be used to feed two antennas — 2 metres and 70 cm from the one feeder, thus saving dual feeder runs up the tower. The only thing to keep in mind is the insertion loss. If two combiners are used, (at the top of the tower and in the shack), this loss will be about 2 dB, which can be made up with antenna gain.

My thanks to Les VK3SL, for without his inspiration (or badgering) this project would not have happened. The combiner could have been built using surface mount components etc, giving perhaps, improved performance. However, the use of "normal" components does give the desired performance and is easier on the constructor. The cost of this project is about 1/3 the cost of the commercial unit at around the low $20s mark.

Well, there it is, I hope you get as much pleasure out of yours as I do with mine. You can say with pride, "I built it myself" (rare these days).

ar

Prevent pirates — make sure you sell your transmitter to a licensed amateur.

Remote TNC Operation

Gil Sones VK3AUI

Remote operation of a TNC from the transceiver is sometimes desirable. This may be due to the PC not being in the shack or the RF noise from the PC may desense an adjacent radio. Here is how to do it.

Remote operation of the TNC is preferable to running long RS232 cables as RS232 is not made for long runs. However the connection between the radio and the TNC is only audio and DC control signals. There are some traps however which can be overcome.

Long audio and DC cables between the radio and TNC may be prone to earth loops and induced hum and noise. These problems can be overcome by using paired cable and matching transformers. The matching transformers convert the unbalanced audio at the radio into a balanced line. This overcomes most problems and the earth loop for audio is broken.

The PTT signal is DC and is relatively high impedance and level and so can be an earth return circuit. The squelch is similar if needed.

Commercially telephone circuits have been using transformers and balanced circuits for years. They also use the wire pair for DC signalling using earth return at the same time.

Telephone cable is cheap and readily available. It is available in small sizes of 2 and 3 pairs which means 4 and 6 wires. The pairs of wires are the balanced circuits. They are colour coded in the cable and some of the types sold use very simple codes. One I saw used colours and the number of colour dots to indicate the pair. The pairs are loosely twisted together and are easy to identify.

The transformers used commercially are 600 : 600 ohm and are made with very good balance and high grade insulation. This is because telephone lines are often subject to high noise and induced voltages.

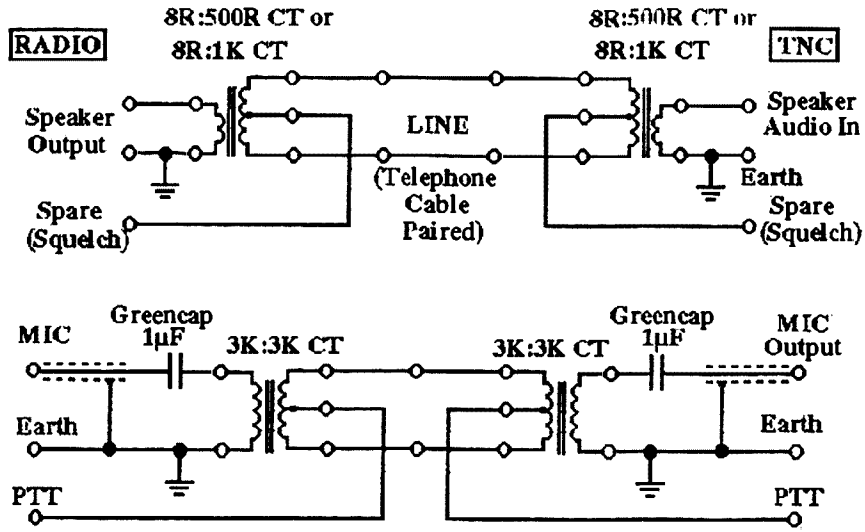


Fig 1 Remote Operation of Transceiver from TNC

However for the sort of line in your home such expensive transformers are not needed. The transformers intended for transistor radio audio stages are adequate and are available cheaply from a number of suppliers. The impedances may be different but they are close enough.

The figure of 600 ohms is after all just an agreed standard and is not the impedance of the cable used.

For the audio output of the radio the transistor radio output transformers are suitable. These have an 8 ohm to 500 ohm or 1000 ohm ratio and the higher impedance winding is centre tapped.

The microphone input can use the 3000 ohm to 3000 ohm centre tapped driver transformers. The impedance is fairly close and the main thing is to balance the circuit as the microphone input is particularly sensitive to hum and noise. A long unbalanced screened microphone lead is an open invitation to hum and noise. An unscreened unbalanced lead is worse.

The loss through a pair of these transformers is pretty small and the balance is adequate. The PTT can ride on the centre taps as an earth return signal. DC blocking capacitors are in series with both the TNC and radio microphone leads. 1 microfarad greencaps or similar are suitable.

The circuit is shown in Fig 1. As can be seen four transformers are used. Two each of the driver type and two each of the output type. The use of 3 pair cable will leave you with a spare pair. This may be useful.

One note of caution. Do not use the same cable for telephone circuits. Telephone wiring and equipment is subject to AUSTEL regulations. Get someone with the appropriate AUSTEL licence to do any telephone wiring.

ar

Remember to leave a three second break between overs when using a repeater.

123 Hz Access Tone for the Dick Smith 430 MHz Explorer

A M Crewther VK3SM
28 Reynolds Pde
Pascoe Vale Sth 3044

The advent of the new 430 MHz repeater VK3REO which requires a tone of 123 Hz for access gave both Reg VK3LS and myself a few headaches. For starters, we did not know the stability or level required for the tone. After some tests we decided that a Wien Bridge oscillator would be satisfactory, and a level about 15 dB below voice was required to open the repeater.

The final circuit is shown in Fig 1 and is a Wien Bridge Oscillator designed round a 741.

This chip needs positive and negative supply lines. As the Explorer has only a 12 V line, a virtual ground was provided by two 10 K resistors in series across the supply, the lower one bypassed by an electrolytic condenser for both stability and to complete the output circuit.

Frequency is adjusted by C1, C2 and R1, R2. As C1, C2 are 0.1 μF then R1, R2 need to be about 12 K. The precise frequency can be obtained by starting with 15 K and paralleling extra resistors.

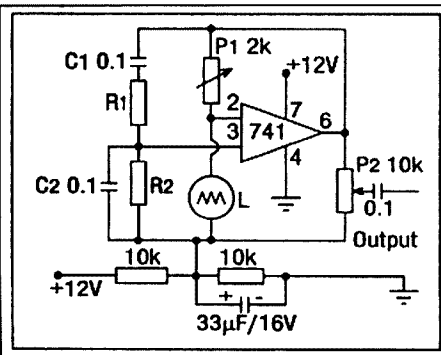


Figure 1

The lamp from 741 pin 2 to virtual ground is any small 20 to 30 mA one and potentiometer P1 is adjusted to give a good sine wave out.

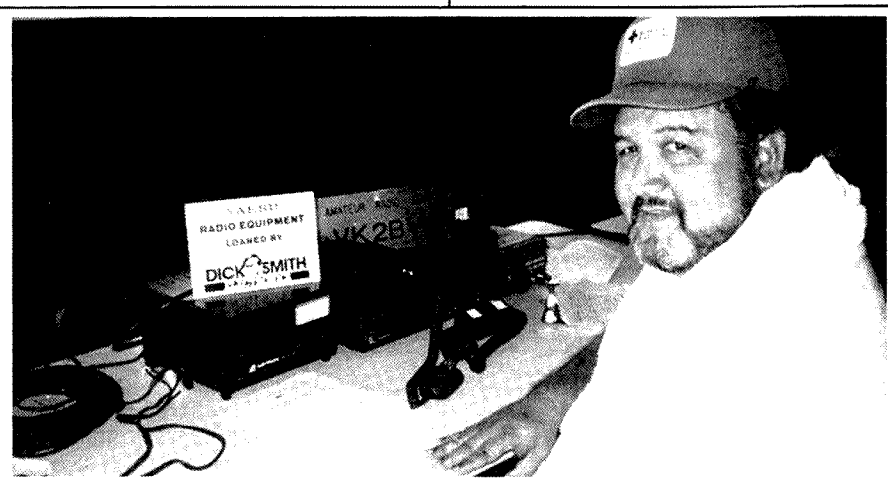
The tone is injected through a 15 K resistor at the junction of R68 and R69, just before the varactor diode in the Explorer. The level is adjusted so as to just access the repeater.

The oscillator was built on a small board mounted just behind the microphone socket. The 12 V supply comes from the board stake at A6 on the main board with earth from the back of the front panels. A switch will be put in next to the microphone socket when I find one small enough. **ar**

Hurricane INIKI — Help from Australia

In the rescue operation in KAUAI after hurricane Iniki devastated the island, two Australian amateurs were instrumental in providing the major civil communications link on the island via Amateur Radio. The agencies assisted were the American Red Cross, the Salvation Army, and other relief organisations.

Amateur Radio equipment and accessories was loaned by Dick Smith Electronics, Coburg Branch, Victoria, to volunteer Amateur Radio operators Sam Voron VK2BVS, and Richard Hoskin VK3JFK. These amateurs flew to the island to assist in re-establishing basic civil communications.



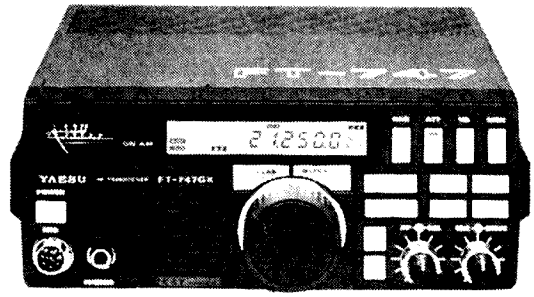
The manager of the Red Cross shelter using Sam Voron's amateur radio equipment at the Waimea High School, to converse with the American Red Cross HQ in Lihue.

The radio traffic that they passed was essential in organising and providing supplies of food, water, medical help, shelter, electricity and essential household items to the hurricane victims. **ar**

DICK SMITH ELECTRONICS

YAESU

GET IN TOUCH... WITH THE WORLD!



2 Year Warranty

FT-212RH MOBILE 2m FM TRANSCEIVER

The FT-212RH is a compact mobile FM transceiver that can also double as an easy-to-use base station. Provides 45-watt output over the 144-148MHz range, with a rugged diecast chassis for superb RF isolation and extensive use of surface-mount components for greater reliability. What's more, it has a large back-lit LCD with bargraph PO/S-meter, 5 selectable tuning steps and a total of 21 memories (18 general purpose, 1 call channel and 2 sub-band limit memories for band scanning). As well, there's inbuilt C.T.C.S.S encode and a variety of scanning functions. Complete with mobile mounting bracket, MH-14A8 hand microphone and DC power lead.

Cat D-3494

SAVE $70 **$499**

2 Year Warranty

FT-747GX COMPACT H.F TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts PEP output on all 1.8-30MHz amateur bands, and general-coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and an easy-to-read backlit digital display, dual operator-selectable tuning steps for each mode, dual VFO's for split-frequency operation, and 20 memory channels (eighteen of which can store split Tx/Rx frequencies). Wideband 6kHz AM and narrrow 500Hz CW IF filters are also a standard feature. Complete with Yaesu MH-1 hand microphone.

Cat D-2930

$1299

WITH ANTENNA BONUS!

Your choice of 2 'Mobile One' mobile HF antennas from our range of 80m, 40m, or 20m whips. ***Worth Over $90***

RMK-747 remote front-panel mounting kit for the FT-747GX is now available. Great for HF mobile operation where space for a full-size rig is limited. See ARA review volume 15. No 7.
Cat D-2931

(Includes installation on your FT-747GX) **$450**

EXCESS STOCK CLEARANCE! — BELOW COST!

$1695 ***UNBEATABLE VALUE***

2 Year Warranty

FT-650 6m, 10m, 12m 100W TRANSCEIVER

Now's the time to enjoy the DX season on the 6m and 10m bands, and the Yaesu FT-650 mobile transceiver allows you to do it in style. It's all-mode operation, 100W RF output (SSB, FM, CW), and continuous 24.5 to 56MHz receiver coverage allows you to hear signals outside the Amateur bands, so you can track the rising M.U.F and work stations as soon as the band opens. The use of 3 D.D.S's and a 2-stage low noise RF pre-amp results in a very quiet and sensitive receiver (SSB/CW, 0.125uV) so you'll hear weak signals much more easily. To cater for the FM enthusiast, the FT-650 provides repeater offsets, an FM narrow mode as well as exceptional 0.16uV (12dB SINAD) sensitivity. Other features include selectable tuning steps, manual/auto IF notch filter, RF speech processor, IF shift control, 105 scannable memories and an effective noise blanker. Includes MH-1 hand microphone.

Cat D-3250

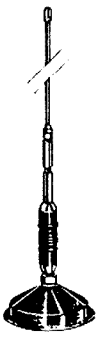
YOUR ANTENNA SUPERMARKET

We carry a wide range of antennas and accessories. Here are just a few...

HUSTLER RX-2 2m 5/8 WAVE MOBILE

Here's value! A quality American 2m 5/8 wave magnetic mount antenna for mobile or temporary base station use. Comes complete with 4.5m of coax cable with a PL259 attached. It provides 3dB gain with a power rating of 100W maximum, and uses a flexible stainless steel whip to minimise wind loading.

Cat D-4805 **$49.95**



HUSTLER 1/4 WAVE MAGNETIC ANTENNA

HUSTLER

A great idea for extending the range of handheld transceivers! The Hustler UGM is a compact 1/4 wave magnetic mount mobile antenna supplied with 2.1m of mini coax fitted with a BNC plug. Simply use the supplied frequency chart to cut the flexible stainless steel whip to the required length for your application (within the 140-500MHz range) and it's ready to use.

Cat D-4802 **$39.95**

DUALBAND MOBILE ANTENNAS

Our exclusive range of Brainer 2m/70cm antennas provide excellent performance at a reasonable price. They feature quality Japanese construction and come complete with detailed, locally written instruction sheets so you can get the best from your mobile station.

a) TM-723m MAGNETIC 2m/70cm ANTENNA

The TM-723m is a compact, slimline dualband mobile antenna ideally suited to vehicles where a permanent mounting position is *not* available (eg. a company car). While just 0.7m long, the TM-723m provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a maximum power rating of 50W (conservative). Supplied complete with low loss coax cable fitted with a moulded PL-259 plug.

$99.95 *New for '93*

Cat D-4812

BRAINER

b) ST-7500 2m/70cm ANTENNA

The ST-7500 is a compact, medium gain dualband antenna that provides good performance when gutter or roof mounted. It's just 1m long, provides 3dB gain on 2m and 5.5dB gain on 70cm and has a maximum power rating of 150W. A quality tapered stainless steel whip element and an inbuilt tilt-over mechanism make the ST-7500 ideal for use on vehicles that often have to enter garages or carparks. Requires an SO-239 antenna base (D-4035 or D-4052 recommended), or SO-239 magnetic mount (D-4520).

BRAINER **$79.95** Cat D-4810

c) ST-7800 DELUXE 2m/70cm ANTENNA

Our best dualband mobile antenna! The ST-7800 is ideal for long range mobile operation, providing high gain (4.5dB on 2m, 7.2dB on 70cm) from its 1.5m length. Like the ST-7500, it incorporates an inbuilt tilt-over mechanism to allow laying the antenna over when entering carparks, and it can either be gutter or roof-mounted with good results. With its high gain and 150W power rating the ST-7800 can also be used successfully as a temporary base station antenna. Requires an SO-239 antenna base (D-4035 or D-4052 recommended).

BRAINER Cat D-4815 **$129.95**

REVEX SWR/ PWR METERS

Revex meters feature quality Japanese construction, large meter movements and low-loss wideband SWR/PWR sensors. We carry 2 of their popular models, the W502 and the W540, each of which provide 3 power reading scales plus SWR measurement, but with differing frequency coverage.

W502 HF/6M METER

Covers 1.8 - 60MHz and has an accurate P.E.P metering circuit. As well, it has 20W, 200W and 2kW scales and a backlit meter. Requires 13.8V DC.

Cat D-1360 **$239**

W540 VHF/UHF METER

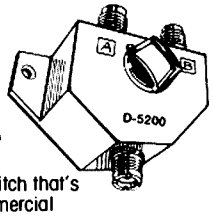
Covers 140 - 525MHz and has an average-reading metering circuit. It has 4W, 20W and 200W scales. Requires no DC power.

Cat D-1370 **$199**

Great Price!

2 POSITION COAX SWITCH

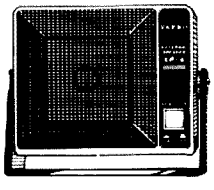
Cat D-5200 **$39.95**



A heavy duty, 2 way coax switch that's suitable for Amateur, or commercial applications. It's well constructed with a die-cast case and can handle up to 2kw PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.

YAESU SP-4 EXTENSION SPEAKER

$39.95



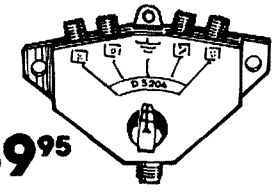
This quality speaker has a built-in switchable noise filter and comes with a swing mounting brocket. It handles 3W at 8 ohms and looks smart alongside any RF rig. Comes complete with lead and 3.5mm mono plug.

Cat D-2300

New for '93

With Surge Protection

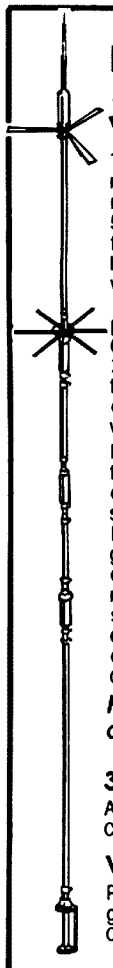
4-WAY COAX SWITCH



$89.95

A high quality 4-way coax switch featuring rugged die-cast aluminium construction, 2kW P.E.P. (max.) power handling at 30MHz, and only 0.3dB insertion loss. It has an in-built surge suppressor and automatic grounding of all un-used connections..... in conjunction with a 'ground' position on the switch, it helps protect against lightning induced surge damage.

Cat D-5204



RUGGED HUSTLER HF 5-BAND TRAP VERTICAL ANTENNA

The tradition continues! The 5BTV is yet another masterpiece from the people who have been making antennas for over 33 years. This rugged 5 band HF trap vertical uses Hustler's exclusive trap design (25mm solid fibreglass formers, high-tolerance trap covers and low loss windings), for accurate trap resonance with 1kw(PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, less than 2:1 SWR at band edges), with 80kHz bandwidth typical on 80m at less then 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands.

High strength aluminium tubing and a 4mm (wall thickness) extra heavy-duty base section provides optimum mechanical stability. What's more, stainless steel clamps and hardware guarantee a longer life. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs the 5BTV can be fed with any length of 50 ohm coax cable.

Cat D-4920

Hurry, last chance at the old price! **$299**

Made in USA

30m RESONATOR KIT

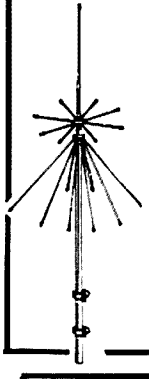
Adds 30m coverage and includes all hardware.

Cat D-4921 **$89.95**

VRK-1 RADIAL KIT

Provides a 5-band ground-plane for above ground antenna mounting positions.

Cat D-4922 **$69.95**



DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz and is easy to assemble and install. With extensive aluminium and stainless steel construction it's extremely durable, while allowing transmission on the 6m, 2m, 70cm and 23cm bands with a maximum power rating of 200W PEP. Complete with mast mounting hardware, stainless steel U-bolts and instructions.

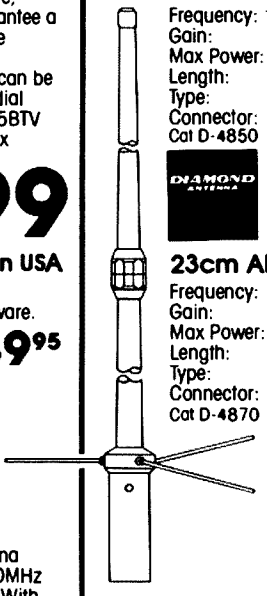
Cat D-4840 **$169**

VHF/UHF BASE STATION ANTENNAS

We carry a wide selection of high quality vertically polarised base station antennas to suit most VHF/UHF Amateur applications. Each antenna was chosen based on its tested performance, reliability, construction quality and value for money, so you can be confident they'll work well the first time and last for years. Brands supported include Diamond and Brainer from Japan, as well as an excellent Australian made Mobile One product.

a) HIGH PERFORMANCE VHF/UHF BASE STATION ANTENNAS

These antennas from Diamond and Brainer are all of a stacked colinear type which provide high gain, wide bandwidth and a low radiation angle for extended range base station operation. Each antenna uses a jointed F.R.P (fibreglass reinforced polyester) outer tubing radome with gasket seals to ensure excellent all weather operation, and is supplied with compact ground-plane radials for a clean radiation pattern. Corrosion resistant stainless steel mounting hardware is also supplied. Brainer antennas are exclusive to Dick Smith Electronics and feature detailed locally written instruction sheets. Both brands are covered by a 1 year worranty.



2m ANTENNA F-23A

Frequency: 144-148MHz
Gain: 7.8dB
Max Power: 200W
Length: 4.53m
Type: 3 x 5/8 λ colinear
Connector: SO-239
Cat D-4850

DIAMOND ANTENNA **$239**

2m/70cm ANTENNA GST-1

Frequency: 144-148MHz, 430-440MHz
Gain: 6.0dB(2m), 8.0dB (70cm)
Max Pwr: 200W
Length: 2.6m
Type: 2 x 5/8 λ colinear (2m), 4 x 5/8 λ colinear (70cm)
Cat D-4830

BRAINER **$199**

23cm ANTENNA F-1230A

Frequency: 1260-1300MHz
Gain: 13.5dBi
Max Power: 100W
Length: 3.06m
Type: 25 x 1/2 λ colinear
Connector: N-type
Cat D-4870

$299

2m/70cm ANTENNA GST-3

Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB (2m), 11.7dB (70cm)
Max Power: 200W
Length: 4.4m
Type: 3 x 5/8 λ colinear (2m), 7 x 5/8 λ colinear (70cm)
Connector: SO-239
Cat D-4835

BRAINER **$279**

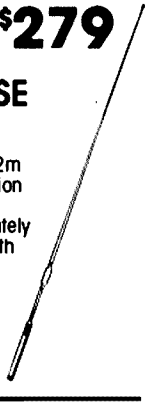
b) ECONOMY 2m BASE STATION ANTENNA

An outstanding value-for-money, compact 1/2 wave Australian-made 2m base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection.

Cat 0-4820

5 Year Warranty **$49.95**

MOBILE ONE



DS XPRESS PHONE & MAILORDER SERVICE
Outside Sydney (FREE Call) 008 22 6610 Sydney And Enquiries - (02) 888 2105
FAX: (02) 806 1986 or write to DS XPRESS, PO BOX 321 N/RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.

DICK SMITH ELECTRONICS

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 871 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 8633 • Hurstville 580 8822 • Kotara 56 2092 • Liverpool 600 9888 • Maitland 33 7886 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney (Greenwood Plaza) 964 9487 • Orange 618 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 68 1711 • Wollongong 28 3800 **ACT** • Belconnen (06) 253 1785 • Fyshwick 280 4944 **VIC** • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 326 6088 & 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0522 **QLD** • Booval 282 6200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 6255 • Maroochydore 791 800 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 • **SA** • Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6088 • St. Marys 277 8977 **WA** • Cannington 451 8666 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 **TAS** • Hobart 31 0800 • Launceston 344 555 **NT** • Darwin 81 1977 **STORES ACROSS AUSTRALIA AND NEW ZEALAND**

AMSAT Australia

Bill Magnusson VK3JT 359 Williamstown Rd Yarraville VIC 3013
Packet: VK3JT@VK3BBS

National Co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z on Sunday evenings depending on daylight saving and propagation . Check-ins commence 15 minutes prior to the bulletin.
Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).
Secondary 3.685 MHz. (Usually during winter).
Frequencies +/– 5 kHz for QRM.

AMSAT Australia Newsletter and Software Service

The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Aust. addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide SA 5001

I have been asked for a complete list of all amateur radio satellite frequencies. The following list is the best I have been able to put together. There are problems in that many satellites have multiple transponders, beacons and modes of operation. Some like the RS series are switched randomly. Fuji rarely adheres to the published schedule for very long. Others like Kitsat are still in experimental mode and can come up on unexpected frequencies. The only way to be certain which of the UoSat-11 beacons is on is to decode the telemetry on 2 metres (which is nearly always on). So it's really a case of keep your ears open, join the AMSAT nets, subscribe to the bulletins, keep up with the packet BBS information and do a lot of listening. Anyway, here's the list. I'll try to update it every six months or so. Please advise me of any errors or omissions.

Satellite	Up-Link	Down-Link
Oscar 10 (AO-10)		
Now out of control. Switches on and off randomly. Transponder may be on the when beacon is silent.		
General Beacon (Carrier only)		145.810
Engineering Beacon (rarely heard, meaningless)		145.987
Mode B		
(SSB,CW-Inverting)	435.030-435.180	145.825-145.975
Oscar 11 UoSAT-2 (UO-11)		
Beacon (1200 AFSK,FM)		145.826
Beacon (1200 AFSK,FM)		435.025
Beacon (1200 AFSK,FM)		2401.500
Radio Sputnik 10 (RS-10)		
Beacon/Robot (CW)		29.357
Beacon/Robot (CW)		29.403
Mode A		
(SSB,CW-Inverting)	145.86-145.90	29.360-29.400
Robot Mode A (CW)	145.82	29.357 or 29.403
Beacon/Robot (CW)		29.357
Beacon/Robot (CW)		29.403
Mode K		
(SSB,CW-Inverting)	21.160-21.200	29.360-29.400
Robot Mode K (CW)	21.120	29.357 or 29.403
Beacon/Robot (CW)		145.857
Beacon/Robot (CW)		145.903
Mode T		
(SSB,CW-Inverting)	21.160-21.200	145.86-145.90
Robot Mode T (CW)	21.120	145.857 or 145.903
Radio Sputnik 11 (RS-11)		
Beacon/Robot (CW)		29.407
Beacon/Robot (CW)		29.453
Mode A		
(SSB,CW-Inverting)	145.91-145.95	29.410-29.450
Robot Mode A (CW)	145.83	29.407 or 29.453
Beacon/Robot (CW)		29.407
Beacon/Robot (CW)		29.453
Mode K		
(SSB,CW-Inverting)	21.210-21.250	29.410-29.450
Robot Mode K (CW)	21.130	29.407 or 29.453
Beacon/Robot (CW)		145.907
Beacon/Robot (CW)		145.953
Mode T		
(SSB,CW-Inverting)	21.210-21.250	145.91-145.95
Robot Mode T (CW)	21.130	145.907 or 145.953
Radio Sputnik 12 (RS-12)		
Beacon/Robot (CW)		29.408
Beacon/Robot (CW)		29.454
Mode A		
(SSB,CW-Inverting)	145.91-145.95	29.410-29.450
Mode A (CW)	145.831/.840	29.408 or 29.454
Beacon/Robot (CW)		29.408
Beacon/Robot (CW)		29.454
Mode K		
(SSB,CW-Inverting)	21.210-21.250	29.410-29.450
Mode K (CW)	21.129	29.408 or 29.454
Beacon/Robot (CW)		145.912
Beacon/Robot (CW)		145.959
Mode T		
(SSB,CW-Inverting)	21.210-21.250	145.910-145.950
Mode T (CW)	21.129	145.912 or 145.959
Radio Sputnik 13 (RS-13)		
Beacon/Robot (CW)		29.458
Beacon/Robot (CW)		29.504
Mode A		
(SSB,CW-Inverting)	145.96-146.00	29.460-29.500
Mode A (CW)	145.84	29.458 or 29.504
Beacon/Robot (CW)		29.458
Beacon/Robot (CW)		29.504
Mode K		
(SSB,CW-Inverting)	21.260-21.300	29.460-29.500
Mode K (CW)	21.138	29.458 or 29.504
Beacon/Robot (CW)		145.862
Beacon/Robot (CW)		145.908
Mode T		
(SSB,CW-Inverting)	21.260-21.300	145.960-146.000
Mode T (CW)	21.138	145.862 or 145.908
AMSAT Oscar 13 (AO-13)		
General Beacon (400 BPSK,		

Satellite	Up-Link	Down-Link
CW, 50 Baud RTTY)		145.812
Engineering Beacon (PSK,CW,RTTY)		145.985
Mode B (SSB,CW-Inverting)	435.420-435.570	145.825-145.975
General Beacon (400 BPSK, 50 Baud RTTY)		435.651
Engineering Beacon (PSK, RTTY)		435.677
Mode L (SSB,CW-Inverting)	1269.330-1269.641	435.715-436.005
Mode J (SSB,CW-Inverting)	144.423-144.475	435.940-435.990
Beacon (PSK,RTTY)		2400.325
Beacon (PSK,RTTY)		2400.664
Mode S (SSB,CW,FM)	435.601-435.639	2400.711-2400.747
Mode Rudak	1269.71	435.677
Oscar 14 (UO-14)		
Mode J (9600 bps A/FSK,FM)	145.975	435.070
Oscar 16 Pacsat (AO-16)		
Mode J (1200 BPSK BBS,FM-SSB)	145.90/92/94/96	437.025 or 437.050
Mode S (1200 BPSK BBS,FM-SSB)		2401.1 or .1428
Oscar 17 Dove (DO-17)		
Beacon 1 (1200 bps AFSK, Digital Voice,FM)		145.82516
Beacon 2 (1200 bps AFSK, Digital Voice, FM)		145.82438
Beacon 3 (1200 BFSK, Digital Voice,SSB)		2401.2205
Oscar 18 Webersat (WO-18)		
Mode J (1200 BPSK,RC,SSB)		437.075 or 437.10
Mode J ATV (TV,AM)		144.30-144.50 1265.000
Oscar 19 Lusat (LO-19)		
(1200 AFSK,FM-SSB)	145.84/86/88/90	437.1535 or 437.1258
Oscar 20 JAS-1b (FO-20)		
Beacon JA (CW,Analog)		435.795
Mode JA (SSB,CW)	145.90-146.00	435.80-435.90
Beacon JD (CW)		435.910
Mode JD (1200 BPSK,FM-SSB)	145.85/87/89/91	435.910
Oscar 21 (AO-21), Radio Sputnik 14 (RS-14)		
Beacon (CW)		145.822
Beacon (BPSK,FM)		145.952
Beacon (BPSK,SSB)		145.983
Mode B (SSB,CW-Inverting)	435.022-435.102	145.852-145.932
Rudak 2 (A/BPSK,FM)	435.016/.155/.193	145.983 or 145.987
Rudak 2 (Various Modes)	435.041	145.983 or 145.987
Beacon (CW)		145.948
Beacon (BPSK,FM)		145.838
Beacon (BPSK,FM)		145.800
Mode B (SSB,CW-Inverting)	435.043-435.123	145.866-145.946
Oscar 22 UoSAT (UO-22)		
Mode JD (9600 Baud FSK,FM)	145.90/.975	435.120
Oscar 23 Kitsat-1 (KO-23)		
Mode J (9600 BPSK BBS)	145.85/.90	435.175
Russian Space Station MIR		
1200 bps afsk packet and voice.	All operations	145.550 MHz

Where a satellite has multiple uplinks it is to help sort out QRM by spreading out the up-linking stations.

To find out which mode is operating on the RS series, listen for the CW beacon. This will indicate which transponder is switched on.

AO-13 frequencies depend on the mode switching schedule which is published regularly via packet radio BBSs and is available first hand by decoding the telemetry beacon information.

UoSat-11 Telemetry Decoding and Display Program

For some years I used the telemetry from this bird in my work with senior electronics and computer science students. We had BBC computers and I had one at home which made it easy to prepare lesson material etc. At about the time I left the education department the format of the telemetry on UoSat-11 was changed. It went all clever with multiplexed channels and forth language telemetry. Only a couple of months ago I sent off to AMSAT-UK for a copy of the new decoding and display soft-ware to suit my newly acquired IBM computer, (a second hand XT).

The new soft-ware (called TLM) is very flash with lots of colour and good resolution. It is capable of handling the entire gambit of UO-11 telemetry modes including ascii bulletins, real-time telemetry and whole orbit data both in graphical and tabular form. It can archive the files for future reference, in fact it does so automatically. It has the option for full screen graphics display or half graphics and half text display. The graph axes can be changed at will to emphasise particular parts of the data and analyse short term trends. Two telemetry channels can be displayed on the same graph with independent control of axis calibration. Screen data can be printed out at any time.

If you're interested in UO-11 telemetry decoding this package will do all you require. Unfortunately it's not available locally, you have to obtain it from AMSAT-UK.

ar

VHF/UHF An Expanding World

Eric Jamieson VK5LP PO Box 169 Meningie 5264

All times are UTC

Antarctica

In November, Mark VK5AVQ (now VK0AQ) arrived at Casey Base for a further stint in the cold regions. In a letter written on Christmas Day, he said the temperature was 0 °C and little wind and so far no blizzards. Visitors during a week or so after 16/12 were to include their supply ship Voyage 5, then a Japanese pilot circumnavigating Antarctica, followed by a Russian tourist ship. From Voyage 5, a team of Army riggers will spend eight weeks erecting towers, plus a new ionosonde. A computer technician will install a new computer network.

Mark says that at Casey there is more snow for ski-ing, instead of the large areas of ice as at Mawson. Casey is an all new station, about 400 metres from the old station, but it appears not to lend itself very well to amateur operation, due to interference with and from other facilities. On HF there are two 1 kilowatt transmitters for company. The base is connected to the ISD telephone network.

For six metres, Gil Sones VK3AUI, loaned Mark an HL86V amplifier and an FP757GX switch mode power supply to supplement other equipment loaned by VK5NY, and a three element beam. He will advise when the six metre beacon is on air. The distance is around 4000+ km.

Other six metre news from the VK5LP shack — 25/12: KH6 and FK8 worked in Adelaide. 30/12: VK7ZMF to NH6YK, KH6JEB, AH6LR, KH6HH, ZL1-4 and VK1-8. 5/1: heard that ZL1ANJ had worked 30 stations in 7 US states, including as far east as Kansas. VK2ZXC said Costa Rica (TI) was in for 3 hours. 6/1: 0500 heard P29BPL, 0800 JAs, FK8DH, 0915 worked ZL3TIC and ZL3AAU, the ZL3MHF beacon S5, also VK3BQS on backscatter. 1001 VK7LZ and VK7ZMF.

7/1: 0100 ZL1ANJ, 0400 VK3XRS, 0900 VK3OT to BZ4BRX, BZ4SBN and BZ4SBV, HL9UH and JAs, 0915 P29JA to VK4s, 0920 VK5BC to VK6ZAK and VK8AH, and VK6KZ to P29JA, 2300 VK4BRG, VK2ZXC, plus VK3OT b/s, 2335 VK4BRG to VK6JQ, VK6PA, VK6RO and VK6HK — really long haul contacts. 8/1: 0933 VK8ZLX 5x9, said KH6 and FK8 were heard at 0430. 12/1: 0513 KH6IAA and AH6LR worked by VK3OT and VK5BC. 16/1: JAs and KH6 at 0300. 26/1: 0417 JAs, Es to VK1,2,3,4,6,7,8 — all states seemed to be working one another, VK6AS said he had worked 2, 3, 5 and 8, much backscatter.

An overall view of six metres would be to say that it has been a good Es season, with contacts available to somewhere almost every day since early December, and this has included FK8. Frequent long haul contacts to KH6. There appears to have been a high degree of ZL activity and this has flowed on to two metres, indicating an increased awareness that two metres Es does exist. Most consistent signals to VK5 have been from VK4 and VK6. My book shows details of many six metre Es contacts by stations throughout Australia. In general, only the more important contacts have been reported, as we all know that at this time of the year interstate contacts occur almost on a daily basis.

Bangladesh

From December 1992 CQ ham radio magazine, courtesy Graham VK6RO, comes news that the DXpedition to Bangladesh produced a total of 503 contacts for S21ZE. There were 488 contacts to Japan with all areas 0 to 9 being worked, with the exception of JA8, which seems unusual. Other contacts were 7 to BV, 2 to BY, 1 each to DU, P2 and S2, 3 to VK, with VK6JQ being the first VK contact. In addition the following beacons were heard — JA2IGY, JA6YBR, JR6YAG, VS6SIX and DX1HB.

Sporadic E

Scott VK2JSR/VK4JSR writes lending support to the previously aired statement that six metres is not yet dead, even if some of the more exotic contacts have disappeared.

On 20/12: 0030 ZL3TY, 0816 VK6BE, 0913 VK6YU, 2050 KH6HI/P, 2106 ZL1AKW, 2108 ZL2KT.

21/12: 0540 ZL2TPY, 0637 JH0HQP, 2223 K6FV heard.

22/12: 0043 XE2HWB beacon in until 0109, 0150 FK8DH, 0207 YJ8LB, 0222 JH0HQP, 0256 JH1HWZ, 0535 ZL4AAA.

25/12: 0126 and 0701 FK8DH.

28/12: 0449 NI6E/KH6, 2138 ZL1ANJ.

29/12: 0122 AH6LR heard, 0805 VK8RH heard.

30/12: 0302 ZL1ANJ, 0304 JH0HQP, 0307 ZL1ANJ, 0456 KH6HME beacon. Scattered amongst these were VKs.

From Europe

Ted G4UPS reports a very low number of contacts for December. Most days he has been able to maintain his tropo contact with G3CCH. SM7AED,OZ3SDL, OH3MF, PAs, LA9ZV, LA7ZV heard/worked. Beacons OZ7IGY, OZ6VHF copied. On 13/12 via Es heard YU7AU, YU1EU, DL8NCI, S59AM, I2ADN and work YU2IQ. The only other worthwhile day was 15/12 when Ted worked LA9ZV, SM7AFI, OZ1LIT, OZ1KJG, OZ5PB, OK1MJL and heard OZ7IGY. On 7/12 ZS6WB reported an opening to southern Europe. (Similar to our VK to JA path....5LP).

Ted also reports some confusion with the ARRL DXCC status of newly emerging countries in Europe, particularly from the breakup of former Yugoslavia. As this is not likely to worry VK stations too much under present propagation conditions, I will wait for more information.

Geoff GJ4ICD reports that Jack ZS6LN passed away early in December after a short illness. Jack would have provided a contact from South Africa to a number of VK stations, so he will be missed. Jack now joins Joel N6AMG (known to many as CN2JP) on the list of silent keys.

Although Geoff on Jersey is lower in latitude than Ted, he seems not to have had any really good six metre openings via winter Es. Geoff also says that in this their winter, the usual anti-cyclones are not materialising, hence little activity on the bands above 144 MHz. On 26/12 an opening occurred on 432 and 1296 to Germany and Switzerland.

While I was writing the above, I wondered why the UK did not experience regular six metre contacts to their closer European countries. In order to satisfy my curiosity, I reached for the atlas and had a look at the UK and its relationship to European countries. I was surprised to find that it is a considerable distance even to the closer countries, such as France, Spain, Holland, Belgium etc., particularly from the more distant parts of the UK. Good for Es but a bit far for daily contacts via groundwave and extended groundwave.

In VK we would consider a path of 300 km beyond many operators, except those with high power and large antenna systems, probably 200 km is more realistic for a good signal. So it appears that when the Es disappears and in the absence of an aurora, the European scene dies like many other places!

Two metres and above

Enclosed with the six metre letter from Scott VK2JSR was a printout of the log of his activities on 144 and 432 MHz. Scott lives at Lindendale, near Lismore in northern NSW, about 170 km from Brisbane.

On 144 MHz, from 18/12/92 to 3/1/93 he worked VK2BBR, VK2DVZ, VK2MZ, VK2ZAB, VK2ZXC, and VK4s AI, APG, ARN, DH, KJL, KZR, LC, OE, QV, RH, YZ, ZAZ, ZDO, ZET, and ZQ. On 432

MHz he worked VK4s DH, KZR, LC and KZR. The contact times were about evenly divided between morning and evening, and many of the 84 contacts were repeated on a daily basis.

In addition to the above, on 144.100, there were a series of Es contacts over considerable distances, noted as follows:

21/12: 0546 to 0605, ZL3AR, ZL3TGI — 2 contacts, ZL3TIC, ZL3TY — 2 contacts.

25/12: 0055 VK7XR.

29/12: 0901 VK3DEM, 0907 VK3BRZ, 0909 VK3AMZ, 0910 VK3XRS. Distances involved were: ZL3TY 2630 km, VK7XR 1564, VK3AMZ 1287, VK2ZAB 570, VK2MZ 382, VK2DVZ 343 and VK4KZR 164.

Repeat contacts made for a total of 11 in this group. Well done.

The above indicates a good overall effort and shows that 144 and 432 is still up and running from VK2 to various points up and down the east coast.

My note book tells me that two metre contacts via Es have been quite common. There were openings prior to and on Christmas day, mentioned last month, between VK5 and VK4, VK4 and VK7ZMF. On 31/12 and 1/1 VK3 and VK4 worked one another. On 5/1 at 0900, VK3AMZ heard ZL4OY and ZL4LZ and worked the latter, while VK2s were also working ZLs. On 6/1VK3AMZ to VK4LV. ZLs also available to north Queensland.

Rob VK3DEM from Bairnsdale, is now operational with SSB on HF, 6m, 2m, 70cm, 23cm and 13cm so he does have a reasonable selection of bands from which to choose! Via aurora, recent 144 contacts have been to VK1AU, VK1BG, VK1DO, VK2NJ, VK2ZRE and VK3AMZ. On 29/12 probably via Es, 144.120 contacts at 0901 to VK2JSR, Lindendale, 0904 VK2BBR at Lismore, 0906 VK4TN at Ashmore, 0907 VK2EJE at Grafton, all 5x9. Also VK3s AFW, ALZ, AMZ, AUI, AYI, BQS, BRZ, DLM, DQW, ELV, KKW, ST, TU, WAL, XRS, YTV, ZJC, VK7KAP, VK7XR and VK7ZMF all on 2m. On 1296 the list includes VK3WAL, VK3XRS, VK7KAP and VK7ZMF. We hope that Rob can maintain that measure of activity.

Wally VK6KZ spent some time around Cape Leeuwin, as far west of Albany as you can go, also at Walpole, and found rewards for his efforts. On 4/1 at 2135 he worked VK5KAF, VK5NY and VK5RQ on 144 but nothing heard on 432. Distance to Adelaide 2152 km. On 5/1 at 0006 VK5AKK on 144 and 432. Then VK6AS at Esperance, 6WG and VK6YAU at Albany followed by stations in Perth.

In VK5 the scene on two metres and above has been fairly humming! Roger VK5NY from his mountain top palace near Willunga has provided what is a fairly representative report of the past month's activities. Most contacts have taken place in the morning from around 2200, but the evening period from 0900 onwards has had its rewards. Those callsigns shown in italics were worked on both 144 and 432 MHz.

From VK5NY: 8/1: VK6AS at Esperance, VK3DQW, VK5DK, VK3AFW. 9/1: From 2100 VK3BRB, VK6ZFY, VK6KRC, VK6HK, VK5KAF, VK3CY, *VK5NC.* 10/1: VK6AS, VK6AXX, VK3BRZ, VK3DUT, VK3AFW. 11/1: *VK5NC, VK3BRZ, VK3ZJC,* VK3AFW, VK3AUI on 50, 144 and 432, VK3DUT, VK3CY, VK3ZXY, VK3AXH, *VK3DLM, VK5DK, VK3AFW, VK3ZQB, VK6AXX, VK5PO/P, VK6WG, VK6AS,* VK3ZJC.

11-12/1 was a great period with the bands remaining open until 0140. Tropo to Perth from VK5 is not common so all made the most of it. The saga commenced with the VK5 beacon being heard well in Perth and phone calls made to alert operators. VK6KRC phoned VK5NY. The beacon peaked at 2110. Wally VK6KZ was portable at Cape Leeuwin and at 2137 on 144 worked Des VK3CY over a distance of 2507 km. At 0120 Wally worked VK5NY on 432, distance 2152 km, also VK5ZDR and VK5AKK. No 1296 to Adelaide nor to VK5NC in Mount Gambier. VK6AS at Esperance was hearing the Perth stations at a distance of 684 km.

VK5NY worked VK6KRC, VK6AO, VK6ZKG, VK6AS, VK6SQ, VK3UM, VK5KAF, *VK6HK, VK6KZ, VK6ZFY, VK5NC, VK6ZSB.* Band re-opened 0400 to VK6AS, *VK6WG, VK6YAU,* then later to VK3CY, VK3AMZ, VK3UM, *VK3DTO.* On 15-19-22/1 VK3ZQB.

27/1: 0254 VK6AS, 0922 VK6AS, VK3BRZ, VK3ZQB, *VK3AUI,* 2200 VK6AS, VK6AXX, VK6JCJ, VK7ZMF, VK3BBX.

28/1: VK3EUC, VK3YJR, VK3AFW, *VK3DUT, VK3AMZ, VK6YAU;* 2247 VK3CY, VK3KTR, VK3XRS, *VK6AS, VK3BRZ, VK3ELV, VK3ZQB, VK3BMB,* VK5ACY/m, VK6JCJ; at 1324 VK6AS5x9.

29/1: 1340 VK6JCJ, VK6WG; 2148 VK7XR, VK5KAF; 2218 VK6ZKG, VK6ZFY, VK6KRC, VK6HK, *VK6KZ.* At 2336 VK5NY worked crossband 144/432 to VK6KZ with good signals both ways, yet Roger VK5NY could not hear Don VK6HK who was close by across the Swan River! Strange. 2343 *VK3BRZ, VK3AUI.* During the above, flashes of radar krud were observed on 432 MHz peaking in an easterly direction. 1296 MHz was tried but no signals out of VK6 or VK3.

There is no question that the boys in VK6 are prepared to rise early — 2200 UTC is 8.30 am in VK5 and 6 am in VK6! Thus it was that at 2207 VK6AXX phoned VK6ZFY to warn him of possible band openings, as the VK5 two metre beacon was audible! Later Roger worked VK3ZGL, VK3BRB and VK3DEP, all in Mildura, the latter station using a vertical antenna! Several meteor pings to the east on 144.100, but not sustained long enough for identification of any signals.

On 10 GHz

Wally VK6KZ reports that 10 GHz is moving rapidly in Perth. VK6KAT and VK6KRC recently worked VK6ZFY/P over a distance of 85 km. VK6XH and VK6ZSB have also been working one another.

Countries first worked from Australia on six metres

No corrections or additions to the list have been received this month, indicating that the list is probably fairly correct. I will leave it open for another couple of months before publishing the final list.

I am also looking at the possibility of publishing a list of what countries/DXCC prefixes were worked on a state by state basis in Cycle 22 only, so that you can make some comparisons. Who worked what will not be included, the list will simply show that a prefix was worked from particular states between 1984 and 1992 inclusive. More later.

Closure

January has been a very hot trying month for most of the southern areas, particularly South Australia with a run of days exceeding 40°C. However, we have survived and looking forward to what DX the equinox may provide.

Closing with two thoughts for the month:

1. Before everything else, getting ready is the secret of success, and
2. Making marriage work is like running a farm. You have to start all over again each morning.

73 from The Voice by the Lake.

ar

FTAC Notes

John Martin, VK3ZJC
FTAC Chairman

An Extra Two Kilometres

Steve Gregory, VK3OT, has extended his VK3 50 MHz short path record. His previous record was 16,922 km for a contact with G4UPS on 19/2/91. However on the same day he worked GW3MFY, a mere 2 km further away! Congratulations to Steve on this new record.

ar

Divisional Notes

VK2 Notes

Tim Mills VK2ZTM

Annual General Meeting

NSW Division members are reminded that the AGM is scheduled for Sunday afternoon 2 May 1993 at Amateur Radio House, 109 Wigram Street, Parramatta. The annual report and business paper will be an insert to the April 1993 issue of "Amateur Radio".

Those members wishing to submit items for inclusion on the business paper for this meeting or to nominate for election to the Divisional Council for the forthcoming year must lodge same at the registered office of the NSW Division at 109 Wigram Street, Parramatta by 2pm Wednesday 17 March 1993.

Those full members nominating and seeking election to the council should note that upon election they become a director of a New South Wales registered company under the respective companies acts. A nomination form is available from the office, which must be proposed and seconded by full members of the Division and lodged by 2pm on 17 March 1993. If more than the required number (nine) of nominations are received a ballot will be conducted.

An invitation is extended to all full members able to attend two (Friday) evening meetings per month and carry out other duties as a councillor of the Division. If you are not able to be a councillor, there are many other functions within the Division open to all members which could benefit by your involvement.

Happenings

Next Trash and Treasure is Sunday afternoon 28 March at Parramatta.

Next exam at Parramatta Sunday 23 May; applications close 6 May.

The Division's lecture class for the year started 1 February. Held on Monday evenings at Parramatta. St George ARS class to start 8 March.

Orange ARC commenced 18 February; details from Bruce VK2DEQ on (063) 62 8703.

Urunga Field Day over Easter; naturally at Urunga on the north coast.

The 2m SSB transmission from VK2WI is frequency changing to 144.150MHz.

Tb contact the Division, see the directory details on page 3.

The technical segment on the VK2WI broadcasts has just started a 22-part talk on Australian Radio, the Technical Story by Winston Musico, 10am and 7.15pm Sunday.

VII50SYD report

Steve Pall VK2PS has come up with some statistics regarding last year's special event station VII50SYD:

The station made a total of 6257 contacts; 1005 of them were with Australian stations, 463 of those in New South Wales. There were 178 contacts in the Pacific rim area, taking in 40 countries.

There were 1445 contacts into South-East Asia, all but 91cm of them were Japanese! Africa brought in 31 contacts, North America 1736, the Caribbean 21, South America 61, and Europe a total of 1700.

The European countries included 154 from the United Kingdom, 295 from Italy, 280 from Germany, 110 from France, 110 from Spain, and 197 from the Commonwealth of Independent States.

Steve Pall VK2PS
Divisional Special Projects Officer

5/8 Wave

Rowland Bruce VK5OU

I would like to thank Jenny, VK5ANW, for stepping in at the very last moment last month to ensure a 5/8 Wave appeared in AR.

Once again work called me away, but on this occasion, being holiday time anyway I was able to tack a couple of weeks onto the ten days I had to attend head office in Paris. It may sound great, all this dashing about the place, but it usually is concentrated work, and this time I thoroughly enjoyed the extra time I spent in England. I must say though, as I sit here in 40 degree plus heat, that it is hard to remember a month ago I was driving up the M1 in a freezing fog. Being away so much recently has meant that I am out of touch with goings on in SANT. I'll catch up for next month's issue I hope. Meantime I shall have to content myself with some generalities and observations.

One local event I did attend was the Christmas social at Woodville. Business was kept to a minimum, and we were entertained by a display of magic, which amongst other things showed the lack of expertise by your President in twiddling knobs on some pretty basic equipment. Perhaps all his gear is push button nowadays! We enjoyed some excellent fellowship and a good supper. Thanks to all those who helped or provided. It was a pity more members could not attend. Note this years date will be the 9th or 16th November.

I received an interesting letter from Colin MacKinnon, VK2DYM, about the closure, due to the relinquishing of the building housing it, of the Telecom Museum in Adelaide, along with a letter he had received from AOTC. I hope I might get permission to print extracts of the letter in due course. Suffice to say that it seems as though the material from the museum, although being well cared for by the History Trust of South Australia, will not be on display until the Trust has built a new science and technology museum in Adelaide. As Colin says, maybe we guys in Adelaide should be pushing for the early funding and construction of the museum, and lobbying for the public display of the entire Telecom collection.

I also received the VK5 Scout Radio Activities News, which gave a very good review of JOTA. In SA alone 1870 members and 419 leaders took part, (Guide figures need to be added to these,) with 125 amateur operators being involved. I'm sure that the amateurs enjoyed JOTA, but equally I am convinced that an involvement like that is deserving of thanks. Well done! I also note that Peter Koen has been re-appointed to the position of Project Commissioner Radio Activities by the Chief Commissioner, Robin Maslen. Robin is committed to the

concept of JOTA, and last year visited seven of the stations involved.

Finally, back to Europe. We don't know how lucky we are. QRM and QRN have to be heard to be believed. I saw very few towers, the building restrictions would be different I would think, and there is a problem with TVI due to the large number of houses with dishes for satellite reception. Oh, and another thing. In Australia we don't get our wire antennas "loaded" with frost!

VK6 Notes

Arthur Lumley VK6ZTL

Notice of Annual General Meeting

It is hereby notified that the Annual General Meeting of the West Australian Division of the Wireless Institute of Australia will be held on 20 April 1993 following the General Meeting which commences at 8pm. The meeting will be held at the Westrail Centre, East Perth.

Agenda

1. Consideration of the council's annual report
2. Consideration of the financial report
3. Consideration of other reports
4. Election of office bearers, viz president and vice-president of the Division and seven other councillors
5. Election of two auditors
6. Appointment of a patron
7. General business which has been duly notified.

Notice of Motion for the AGM must be received by the secretary not less than 42 days prior to the meeting, and must be signed by at least three members.

Nominations of a candidate for election to council must be received by the secretary in writing not less than 42 days prior to the meeting, with an intimation that such candidates are willing to act. A candidate may submit a statement not exceeding 200 words outlining his or her case for election, and experience. Each nomination shall be signed by two members proposing the candidate.

Candidates must possess a current amateur licence.

Proxies

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the secretary prior to the meeting and be in the following form:

I ....., a member of the Institute, hereby appoint ....., also a member of the Institute, to act for me as my proxy, and in my name to do all things which I myself being present could do at the meeting of the Institute held on .....

Signed:

Witness:

Date: ar

How's DX

Stephen Pall VK2PS PO Box 93 Dural NSW 2158

Poor QSL practices are the worry of all QSL managers. Whilst handling the cards for the special event station VI150SYD I noticed that many amateurs, especially novices, are having difficulty providing the correct information on their QSL cards. Most common problems:

a. Individual watches are not synchronised with correct time (time differences up to one hour).
b. Local time or "am" or "pm" or "night" was used instead of the accepted UTC (GMT) time.
c. Date of the day was wrong, especially if the contact was around 2200 UTC time. Apparently some amateurs cannot distinguish between the local day and UTC day.
d. They are happy to have had the opportunity to work the special event station and ask for a direct card but they do not enclose a self addressed stamped reply envelope for the direct reply.

One only hopes, as time goes by, that they will pick up the necessary knowledge to fill in a QSL card correctly.

Chatham Island DXpedition ZL7AA

Nine New Zealand amateurs organized by Stan ZL2AHC, the NZART Field Day Contest Manager, will be active from this island beginning 0800 UTC on 1 March. The activity coincides with the national NZART Field Day, which takes place on 5 and 6 March. VK contacts are very welcome. During the Field Day, operations will take place on the 40 and 80 m bands. On other days they will be active from 160 to 10 m, including some WARC bands, and on 6 and 2 m. The group will take triband beams, seven transceivers, and equipment for six and two metres. The preferred route for QSLing is direct, with SASE to PO Box 54, Hastings NZ which is the business address of ZL2AL. QSLs will also be accepted via the bureau.

160 Metres Revisited

In AR for April 1992 I asked you to build that special antenna of yours for the 160 m season which usually starts around late April and ends mid-August. Have you done so ? Bob, VE7BS reports that in March 1992 there were excellent signals from Clipperton FO0CI, and weak ones from V85AA. During the northern summer in 1992, he had 58 trans-Pacific contacts, mostly with VKs. On at least 70% of the 92 days (May-August) there was an opening between VE7 and VK. Besides, Bob W0ZV is also quite often on the band.

Incidently during the recent activity from Howland Island the DX station AH1A was heard and worked (on 1822 kHz) from eastern Australia with quite acceptable signal strength. But one had to have the right antenna for the band.

Howland Island AH1A

This much expected DXpedition was first heard as planned on 26 January and closed down at around 1700 UTC on 3 February.

Atsu, VK2BEX operating on Willis Island as VK9WW.

Ian G4LGF, one of the expeditioners, told me that they made just over 50,000 contacts and were preparing to leave the island. The seas were rough, and some inflatable dinghies were overturned. The last two stations operating were SSB on 14195 kHz and CW on 7023 kHz. During their stay it rained almost every night although Howland Island is usually very dry.

Members of the expedition met the transport vessel loaded with equipment and supplies at Christmas Island (T32) on 19 January. After a six day voyage they landed safely and began operating immediately. There were four complete HF stations at two separate sites, one primarily CW and RTTY, the other for SSB. This permitted simultaneous operation on several bands. It was a well organized and well disciplined operation. The callsign was announced frequently and this reduced the possible interference quite considerably.

Clear instructions were given regarding listening-up frequencies and geographical areas to be worked. Despite all this, the Europeans (and one has to say, as usual) were not always as disciplined as the expeditioners would have preferred. The overall cost of the expedition is around $75,000. Individual operators of the ten-person team are committed to $6,000 each, besides their personal transport costs to Christmas Island, so try to be generous with your donation when you send your QSL cards to Mile-High DX Association (MHDXA), PO Box 1, Frankton CO 80116, USA.

Desecheo Island KP5

Randy Rowe, N0TG reported that the whole activity of this brief but successful expedition lasted four and a half days. They had a rough sea voyage (seas running 8 to 10 feet) and the landing on the island was difficult and treacherous. Their campsite was raided during the first night and the spare generator went "missing". The US Coastguard apprehended the perpetrators and recovered the stolen goods. Despite the short time spent on the island the group made 23,000 contacts. Cards go to Randy Rowe, N0TG, PO Box 891, Desoto, TX 75123 USA.

Ethiopia 9F2

Rudi DK7PE has been in Ethiopia and was reported working on 30 January at around 0600 UTC, CW on 14025 kHz, with the callsign 9F2CW/A. The "A" was assumed to indicate Asmara the capital of Eritrea, an independent province (formerly part of Ethiopia). This country may again be restored to DXCC status.

According to Rudi, under the old regime, ET3PG was the club station of the police.

However things are changing in Ethiopia. In January 1993 five foreign amateurs received Ethiopian licences. Rudi DK7PE, Rolf, HB9CVB, Sid G4CTQ and Admase (formerly ET3AR) have helped to form the new Ethiopian Amateur Radio Society (EARS).

Kingman Reef KH5K and Palmyra KH5

As you read this the activity from these islands should be at a peak. Twelve amateurs planned to depart Honolulu on the boat "Machias" on 28 February. Expected time of arrival on the reef was 5 March. Eight operators landed there and four others travelled to Palmyra. The operation from both locations will last nine days in total. Europe will be the main target area. Some WARC bands will also be activated.

Future DX Activity

- Cristian, who operated from Chad as TT8SA, will be in Angola from January and active as D2SA for the next two years. QSL to Antoine Baldeck F6FNU PO Box 14, F-91291 Arpajon Cedex France (SAE + US$2)
- Eli, HA9RE (See Jan 93 AR) has left USA on a catamaran for T30 and T33. By the time you read this, he should be on the air.
- Dave, ZL3DK of the Hastings Branch of the NZART will be looking for contacts on 1840 kHz from 0700 to 1400 UTC on Friday 5 March and Saturday 6 March. This activity will coincide with the ZL Field Day.
- Look out for a possible activity from 9G, Ghana. Several members of the Dutch DAGOE Foundation are trying to raise funds for special medical facilities in Ghana. Ghanaian authorities agree this action will create good relations between Ghana and other national radio societies.
- FD1SIL is active as TT8AKX until end of March.
- ZK1DT is Hugh on Penryn Island until 1996. QSL direct only to Hugh Thomforde, Penryn, North Cook Islands, Central Pacific.
- Ken WA4OBO plans to return to Chad around the middle of March.
- VR6BB is still active from Pitcairn Island. QSL to JH2KOZ.
- Raelene VR6RC — daughter of Tom, VR6TC, was heard from Pitcairn on several occasions on the 28 MHz band. QSL to Box 1, Pitcairn Island, South Pacific, via New Zealand. As the ship bringing supplies and mail comes only every three months, do not expect a card back in a hurry.
- According to the DX News Sheet we can expect some activity from the Andaman and Nicobar Islands (VU7) in March or April.
- Bud, S92ST, Leslie S92YL and Chas S92SS are active in Sao Tome.

Interesting QSOs and QSL Information

Note : Callsign, name, frequency, mode, UTC, month.

- EL2PP, Monica, 14226, SSB, 2244, Dec. QSL to Box 2274, Monrovia, Liberia, West Africa.
- OD5JY, Faiz, 14252, SSB, 0555, Dec. QSL via Bureau.
- 3W4VL, 21003, CW, 0615, Dec. QSL to OK3IA, Pavel Horvath, Radvanska 16, 81101 Bratislava, Slovak Republic.
- XX9TRF, 14019, CW, 0950, Dec. QSL to K2PF, Ralph G Fariello, 23 Old Village Road, Hillsborough NJ 08876 USA.
- VR2GO, Tom, 14215, SSB, 1105, Jan. QSL to Tom Ewing GPO Box 9887, Hong Kong.
- AH0AM, David, 14265, SSB, 1056, Jan. QSL to KB4TXM, David L Creel, PO Box 209, Saipan, MP 96950 USA.
- XR6M, 14194, SSB, 1025, Jan. QSL TO CE6TC PO Box 1234 Temuco Chile, or via the Federachi QSL Bureau PO Box 72 Valparaiso Chile.
- T32BB, Bob, 14192, SSB, 0913, Jan. QSL to DF6FK, Norbert Willand, Leipziger Ring 389, D-60554 Rodgau 3 Germany.
- VP2MH, Laughton, 14226, SSB, 1209, Jan. QSL to KC4DWI BD Kellam, PO Box 936 Cheriton VA 23316 USA.
- V73S, 14021, CW, 1033, Jan. QSL to Oklahoma DX Association PO Box 88, Wellston OK 74881 USA.
- V85AA, Bill, 14226, SSB, 1207, Jan. QSL to Box 1711, BSB, Brunei.

From Here and There and Everywhere

- Neil, VK6NE Federal QSL Bureau Manager for VK9 and VK0, reports that he received some cards for VK0PB. After checking with DoTC it is quite clear that the operator is a "slim". Save your cards and money.
- The Hungarian BUS Expedition (HA5BUS) has run into some financial difficulty in Los Angeles. The bus was impounded by the relevant authorities because the operators were unable to pay the balance of the shipping fee, the demurrage fees and other costs which amounted to over US$15,000. Their plight was televised on a local TV channel and in response, a local businessman of Hungarian origin paid their debt. The bus was free again. They are still in trouble because they were not able to secure a US amateur transmitting licence. There is no reciprocal amateur licence agreement between USA and Hungary. However they already have a Canadian

licence VE/HA5BUS and a Mexican licence 4C2/HA5BUS. I was advised by Imi, HA5HO, one of the operators, that the VK5BUS cards are in preparation and he hopes that the hiccup with the other QSL cards will be solved in the near future. They will be mailing some 1300 cards from Los Angeles soon. The future of HA5BUS is still bleak. The continuance of the voyage depends on availability of funds.

- The popular Southern Cross DX Net (each day at 1100 UTC on 14226.5 kHz) has been subject to very severe interference from a FAX transmission originating from Europe. The interference won. The net moved up to 14236 as from 1 February.
- Francisco HV3NAC was heard operating on 10 January on 14024 at 0806, directing QSLs to his manager IK0FVC.
- Following integration of the two postal systems (West/East) a new five digit post code system will be introduced in Germany from 1 July.
- VU7API and VU7SF were active from the Laccadive Islands. QSL to Phillip W2XP (PO Box 41366, Nashville, TN 37204 USA) who in turn will accumulate the mail for a safe transhipment to India. Send a "green stamp" for return postage.
- Brian, C21BR announced that he is returning to New Zealand mid- April. Future QSL cards for contacts with C21BR should be sent to his home call ZL1ACX.
- P29BT went back to the USA mid-February.
- VI6CKB is a special call celebrating the centenary of the City of Kalgoorlie-Boulder, the centre of goldmining in Western Australia. QSL via the Bureau or to PO Box 463, Kalgoorlie 6430 Western Australia.
- According to the "DX News Sheet" AP2US is a "slim". Please do not QSL.
- If you had a contact with SOIDBA send your card to VK4HD.
- The address of the Slovak QSL Bureau is PO Box 44-8100C, Bratislava 1, Slovakia.
- If you worked ET3RA he was Rolf HB9CVB, QSL to his home call.
- The special event station VI150SYD celebrating the 150th anniversary of the City of Sydney made 6257 contacts with over 160 DXCC Countries during its operation in 1992.
- YB7AWW is Eric. QSL to Box 185 Rosebery NSW 2018 Australia.
- The address of the QSL Bureau for OK1 and OK2 amateurs continues to be PO Box 69-11327, Praha 1, Czech Republic.

QSLs Received

From managers: V51HL(W3HNK 3W), V85BJ (VK2KFS 3W), YA5MM (LZ1HA 3W), XU0NU (F6FNU 4W), PY0FF (W9VA 10W).

From operators: VK9NL/W (3W), VK9WW (4W), HI3AB (18M), V73CT (3W), ZD7CRC (10W).

Thank You

I am always grateful for the assistance received from the supporters of this column. Judging by the number of letters received, there are many of you out there in the readership. Soon you will have a full report. Many thanks to VK2CSZ, VK2KFU, VK3DD, VK4DA, VK4OH, VK5QW, VK6NE, F6FNU, VE7BS, ZL2AHC, and the following publications QRZ DX, The DX bulletin and the Dx News Sheet.

Good Dx and 73.

ar

Pounding Brass

Gilbert Griffith VK3CQ 7 Church Street Bright Vic 3741

The simplest method of sending when it is your over is to use the transmit switch on the rig and start pounding the key. Although this might not be the easiest way if your rig is configured to operate using semi-break-in or full break-in modes, your rig may have its own internal keyer built in so that there is no need for a key at all and a paddle can be connected to the input instead. (The standard fitting has a 6.5mm phone socket on the rig and your 6.5mm stereo phone plug should be wired with the tip to the dot paddle.)

Equipment with all the "features" can still be switched to transmit mode as mentioned, but there is a disadvantage in that you cannot receive anything until you manually switch back to receive mode. This can be disconcerting if you happen to drop dead while transmitting. You have probably experienced other disconcerting moments such as, when, in the middle of a word, your contact abruptly stops transmitting. You eventually find his phone number and ring to see whether a fuse has blown or something more serious has happened.

Most rigs have a "delay" control which causes the transmitter to switch on when the key is pressed, and, depending on what level of delay is set, switches the rig back to receive after you stop sending. This delay can be set so that if you don't send anything for 10 seconds the rig switches to receive, much easier than manually controlling the transmitter. Or you can shorten the delay so that it switches between your sentences, words or even letters. This mode is commonly referred to as semi-break-in, where you can hear for a short time between words. If the delay control has an off position, (which may be tagged "full"), then the delay is non-existent and you can hear between every dot and dash.

Full break-in is the ability to hear incoming signals between your own dots and dashes. This takes a bit of getting used to at first, especially if you neglect setting the equipment up beforehand. Careful control of the AGC speed (which should be set to "fast" or "off"), the receiver volume, as well as the volume of your own sidetone, and background noise are essentials. Practise working a strong "friendly" station with the RF gain turned right down so that the volume of his signal is about the same as your sidetone, it should also be the same pitch. There should be little evidence of background noise when receiving until you are familiar with the operating practices anyway.

Much time can be saved as transmissions are ended with a simple "BK" or "K" to let the other operator have his go. It is amazing how much you can say in the ten minutes or so between identifications. It can be quite exciting when there are three or more stations operating together, you can tell who is talking by their "fist" alone. Other stations have to be quick and lively if they want to sneak a comment in, which makes for a lot of fun.

A simple way of implementing a full break-in system is to use a separate antenna for the transmitter and (separate) receiver. A single antenna may be switched by a timed relay, but it may be preferable to leave the transmitter connected to the antenna permanently and use the relay to disconnect the receiver whilst transmitting. It is then easy to use the other relay contact to earth the receiver input. If you do not earth the receiver input you will need to put two diodes "back to back" across its input, otherwise something is sure to cook.

To summarise, full break-in denotes that you can hear between your own dots and dashes. Semi break-in usually means you can only hear between your words but can probably include the range of delays from hearing between letters, words and sentences.

This is very convenient when interruptions may be required as many operators

waffle on in long "overs" when the listener may be temporarily needed elsewhere. Semi break-in with a long delay, say three seconds, is the easiest way to control your transmitter.

Essential reading for Morslacs

"An End To Silence — The Building of the Overland Telegraph Line" by Peter Taylor (VK4FV), published by Methuen in 1980.

Following my mention of the history of the telegraph in this column, Peter wrote to me with some further information.

"Normally a message took about eight hours to reach London, but at a celebration dinner in Adelaide on 15th November 1872 a reply was received from London in two hours, but only because the line was cleared all the way through for the occasion."

"In good conditions an experienced operator could send about 50 to 60 words a minute, although in normal working conditions about 30 wpm was more usual. However the underwater link from Darwin was much slower. Because the signal was very weak it had to be read directly from a galvanometer and this brought the speed down to about three wpm. Even though automatic repeaters came into use along the land line the contact through the underwater cable was always manual."

"On 23rd February 1874, Aborigines attacked the telegraph station at Barrow Creek, about 200 miles north of Alice Springs. One man was killed instantly (John Franks. Ed) and the officer in charge, James Stapleton, was speared while trying to close the main gate. One of the others sent the news to Alice Springs, where they immediately opened the line to give Barrow Creek a direct connection with Adelaide. When Todd received the news at the GPO in Adelaide he immediately sent his carriage for Stapleton's wife, who lived in an Adelaide suburb. When Stapleton, who was clearly dying, heard that his wife was in the telegraph room in Adelaide he insisted on being lifted to the key. Todd listened as his message came through from that lonely station north of Central Mount Stuart, writing down each letter as it came. It was a short message. When it was finished Todd silently handed the slip of paper to the woman beside him. It read "God bless you and the children."

If you are driving north to Darwin you can see the graves of the two men in a small enclosure near the telegraph station on the east side of the highway."

"More interesting (but perhaps less informative), the first news of the bombing of Darwin in 1942 came down the telegraph line to Adelaide A technician in Darwin was carrying out tests with Adelaide when he broke off because of an air raid warning (and who would argue with that QRX?). After the raid the Divisional Engineer in Darwin, Harry Hawke, came on the line with news of the raid. The tech had been killed in the raid, the telegraph office had been destroyed and Hawke was using a portable key which he clipped on the line at the end of Smith Street. An army officer fished up the underwater cable from the shallows and cut it so that it would not be available to the Japanese."

Peter also says in his letter that he had no knowledge of Amateur Radio when he wrote the book. He has now had his licence for two and a half years, and is a fully paid up CW addict.

73
Gil
ar

A Packet of Packet

Kevin Olds VK1OK 238 Southern Cross Drive Latham ACT 2615

News came to hand over the Christmas/New Year break that the South Australian Packet Users Group is embarking on a project to compile a packet/network directory for Australia, much the same as the Repeater Directory which appears in the WIA Call Book. This a major but worthwhile project and congratulations are in order to the group for deciding to give it a go. However, it will only be as good as the information they are able to gather. So when the call goes out for information to compile the list, I urge all groups to respond with the details requested. If everyone assumes that someone else will provide the information then things won't be of much use. Don't expect to see any results immediately, these things take time.

Before tackling this month's topic, might I repeat my request for feedback on what you think of the information presented and what you would like to see in the column. I'll try to satisfy all reasonable requests some requests may take a little longer to produce so be patient if between your suggestion and delivery some time elapses.

The first two columns have reviewed some of the happenings in the amateur radio world which have impacted on the packet radio scene. This month we have a topic, which while not strictly packet, deals with an area of development which is already starting to have an impact on the packet scene overseas, and of which more will be heard in Australia in the near future. This months item has been kindly provided by Hugh Blemings, VK1YYZ and introduces the subject of Digital Signal Processing or DSP. This item was also presented to the CPRG Technical Symposium in September 1992. A future column will examine the application of DSP to packet radio in the form of a radio modem that could be all things to all people, just change the software. But now over to Hugh.

An Overview of Digital Signal Processing

Digital Signal Processing by its very nature uses some very complex mathematical techniques. It is not intended to cover their intricacies in this paper, rather to provide a more practical look at the topic. There are excellent books available on the subject which provide a more in-depth mathematical treatment of the techniques used.

What is DSP?

DSP is the arithmetic processing of real-time signals which have been sampled and digitised in both time and amplitude. A simple DSP system might consist of an Analogue to Digital converter (A/D), a microprocessor, computer, or dedicated DSP chip and a Digital to Analogue (D/A) converter, as shown in Figure 1.

Other DSP applications may call for a number of different analogue "front ends"

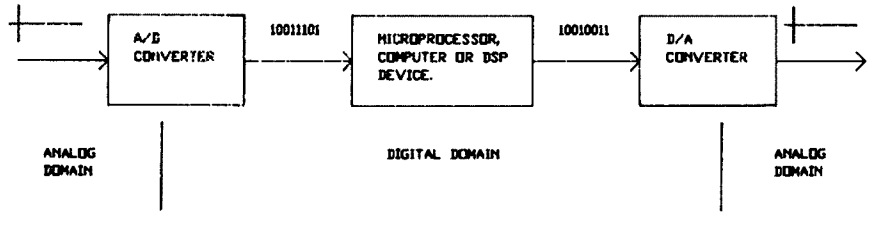


FIGURE 1 SIMPLE DSP SYSTEM

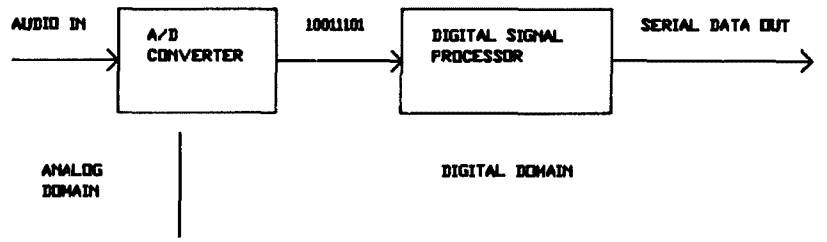


FIGURE 2 SIMPLE DSP FSK DEMODULATOR

or only an single A/D device and associated components in the case of a simple FSK demodulator (Figure 2).

In other words, DSP is a method whereby numbers which represent an analogue signal's amplitude at a known time are manipulated (added, subtracted, multiplied etc) or otherwise processed using a mathematically derived algorithm to generate a new number or set of numbers. The resulting output can then be used to generate a new analogue signal, turn on a light bulb, send data to a computer etc.

Advantages of DSP

DSP offers many advantages over conventional analogue processing, these include;

Stability, Repeatability and Simplified calibration

In typical DSP applications, the system is locked to a quartz crystal derived master clock, the implication then being that a system will remain accurate to a limit defined by this clock signal. An analogue system by comparison may have tens or hundreds of components that can drift independently with temperature, manufacturing tolerances etc. Provided that the software and coefficients used are correct a DSP system will be unconditionally stable.

Following from the above, a DSP system is essentially 100% repeatable unlike say an analogue gyrator circuit which will typically defy all attempts at analysis, calculation and consistent construction etc.

Calibration in a DSP based system will typically be far simpler compared to its analogue equivalent or even non-existent as all parameters such as filter coefficients etc are stored as part of the systems software and are locked to a single frequency reference. Calibration may consist of no more than setting gain levels in the analogue front end and checking the main reference frequency using a frequency counter or similar device.

Power Consumption

Power consumption in a DSP system can often be significantly lower than its analogue counterpart, particularly if CMOS based devices are used. Additionally most DSP devices are fully static in design and hence power consumption is defined by operating speed. This allows a system to be placed into a standby level of power consumption by either slowing or stopping the system clock. This reduction in power consumption becomes more dramatic if a DSP system is replacing several different analogue modules, each with many components.

Power supply design for a system utilising DSP may be simpler as a result of the reduced need for unusual bias voltages etc.

Cost

Cost in a DSP based system is a complex issue, particularly in the commercial realm. Comparisons must be made between the total cost of designing a system using analogue methods and the costs of developing a system using DSP techniques. Additionally the relative costs of manufacturing of each method must be considered.

During the design phase of the project, the sort of factors that need to be considered will include engineering time, cost of development tools and/or test equipment required, cost of prototypes, and cost of any special staff/skills that need to be imported if they are not available in house. For the subsequent manufacture of the device, further cost considerations manifest themselves including (but inevitably not limited to!) the cost of; Components, Printed Circuit Boards, assembly/construction and calibration/Quality Control.

For the right project, the cost of using DSP techniques can be much lower than an analogue based system.

Chip Count/PCB Size

A DSP based system will typically result in a lower chip count than its analogue counterpart and as a result printed circuit board sizes are often smaller.

Algorithms/Functionality

Many algorithms or complex functions that can be implemented with DSP systems are difficult if not impossible to create using analogue techniques. For example, very high Q filters that do not introduce phase distortion within the pass band or near cut-off points and band stop filters with almost infinite attenuation at the desired frequency are readily implemented with DSP techniques.

For amateurs, being experimenters by nature, one of the main benefits of using DSP systems is in the ability to be easily modified, typically without changes to hardware. Using the example of a packet radio modem, it is possible to design a system that uses a common hardware design with a variety of different software modules to implement all of the current data modulation techniques.

Disadvantages of DSP

The use of DSP techniques has a number of disadvantages, some of which are particularly applicable to the amateur/hobby user.

Complex mathematical and theoretical concepts

Perhaps the greatest disadvantage in using DSP techniques for the amateur/hobbyist is the complexity of the maths involved. Those of us who have never done or have long forgotten medium level calculus and related subjects will find some aspects of the field heavy going.

Complex hardware design considerations

Real time processing of the type called for in DSP techniques can necessitate a lot of processing power which invariably manifests itself as high processor clock speeds and bus data rates. Veroboard is largely out of the running.

Expensive development tools

In the commercial arena where high productivity is crucial, high quality development tools are mandatory. These can be very expensive depending on the systems in use and hence prohibit many smaller firms from making use of this technology. For the amateur, access to these tools may not be so crucial as by nature of experimentation a suck-it-and-see approach is often quite acceptable and generally more fun!

High component cost

In simple applications, the relatively high cost of DSP chips and their associated support devices is not warranted. A system which requires nothing more exotic than a simple R-C filter is not a good candidate for DSP.

As device costs are quite high the experimenter can be placed in something of a dilemma when considering developing hardware from the ground up as an incorrect design could ruin a $100+ device.

Inability to deal with very high frequency signals

DSP systems rely on accurate quantised digital data and as such must be able to sample the signals in question at a minimum of twice the signal's highest frequency component (Nyquist's theorem). Cheap A/D and D/A devices stop at sample rates of the order of 5-10 MSPS (Million Samples Per Second). Sample rates higher than this call for specialised components which are inevitably high in cost.

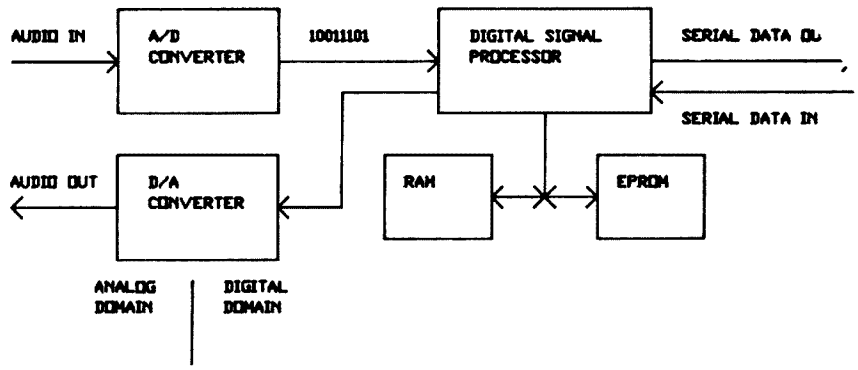


FIGURE 3 SIMPLE DSP BASED MODEM

Some common DSP applications

Radio and Telephone Communications

DSP is an ideal choice for use in radio or telephone communications applications. Figure 1 shows a simple DSP system. Minimal hardware can be added to this as shown in Figure 3 to provide us with all the necessary hardware to construct a complete and very versatile DSP based modem. The versatility of a system like this comes from the underlying nature of DSP systems, that is that everything is done within the digital domain using a number of mathematically derived algorithms. This modem with appropriate software is then able to handle virtually any kind of modulation technique desired, FSK, PSK, PAM etc.

For the amateur this can be a real boon as only one common hardware design is used and changes to the software do the rest. The soldering iron, oscilloscope and junk box has been replaced by maths and programming.

A group of amateurs in Finland have developed a general purpose DSP board and appropriate software which will allow experimentation along the lines of the above. This board is based around the popular Motorola DSP56001 chip, a device which allows up to 56 bit resolution (336dB) at upwards of 20MIPS (Million Instructions Per Second) at 40MHz clock speed. As a brief sideline, an IBM PC compatible using a Intel 486 processor at 50MHz runs around 10 MIPS. There is documentation available on these boards and some Australian amateurs are looking into producing these boards once the design has been finalised. Further information can be obtained from the author or through the Canberra Amateur Packet Radio Group (CAPRG).

Test and Measurement

DSP techniques are being used extensively in the area of test and measurement. Most modern digital oscilloscopes, spectrum analysers, time domain reflectometers, radio test sets and the like make use of DSP to some degree.

Domestic and Professional Audio, Musical Instruments

One of the larger growth areas in DSP is within the audio/music field. A now commonplace example of DSP is in the humble domestic CD player which uses simple DSP techniques as part of the process of recovering the high quality audio which has made CD so popular.

Most professional recording studios have embraced DSP as the best way to provide a level of recording quality and digital effects (echo, reverberation etc) that was inconceivable using analogue systems.

DSP based signal processors (so called effects units) have now moved down-market as well with astonishing quality being available from units costing under $300. Modern day electronic musical instruments use DSP almost exclusively to provide very high quality reproductions of acoustic instruments such as piano, strings, brass and woodwind etc. Synthesisers, which use what amounts to wave form synthesis to create purely electronic timbres have moved forward in leaps and bounds since the evolution of DSP.

A Practical Example

In this section a comparison will be made between an existing analogue based system and an equivalent system implemented using DSP techniques. This example is taken from work recently performed by Newton Pty Ltd, a Canberra based electronics engineering and manufacturing firm.

The client specified a cassette based voice logging recorder and desired a number of fairly unique features. Of particular relevance for the purpose of this study was the following.

- Voice activated recording — with an audio delay to prevent loss of information during tape start-up.
- Time and Date recording — each time a voice message was logged it was desired that the device would record the current date and time onto the tape in addition to the message itself. It was re-

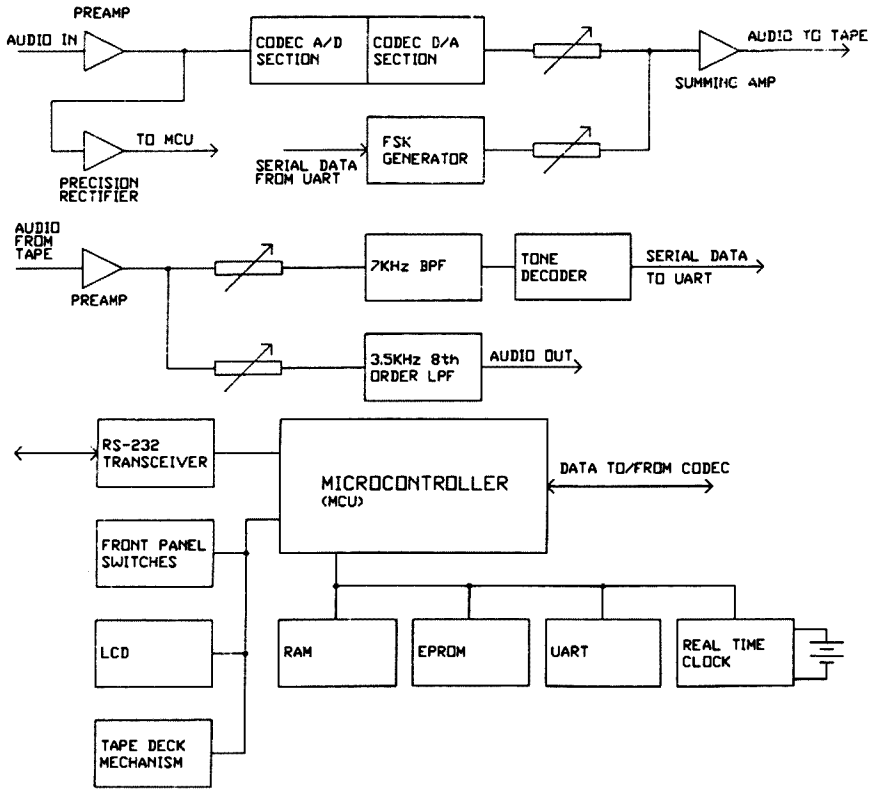


FIGURE 4 CASE STUDY BLOCK DIAGRAM

quired that this time stamp be inaudible during playback.

- Long recording time — an auto reverse, four track cassette deck was used to enable the system to record up to 180 minutes of messages on to a 90 minute cassette.

Figure 4 shows a block diagram of the system that was designed.

Rather than go into full details of the circuit operation, we'll just note that using analogue techniques, the above circuitry requires around 200 components and approximately half an hour to perform the calibration required for correct operation.

Figure 5 shows the block diagram of the DSP based equivalent to Figure 4.

Functions that were originally performed by the microcontroller can now be taken over by the DSP device which at the sample rates in use still has sufficient processing power left over.

By using a DSP system the component count is considerably reduced as well as the amount of calibration time required.

The software required to roll all these functions into one device is far from trivial and it was this factor which led our company to use an analogue/digital hybrid as shown in figure 4 instead of the DSP based system in figure 5. Had the relevant DSP programming expertise been available in house it would have been cost effective to implement the system using the DSP solution.

This particular example can be considered something of a borderline case. Manufacture cost of the finished system would have been lower due to lower component count and resulting lower labour costs however as explained above, the development difficulties meant the use of DSP techniques would not have been cost effective.

Conclusions

Digital Signal Processing is a field which lends itself to experimentation for those with an interest in computers and programming as well as the amateur radio operator who has a degree of computing skill.

DSP is a complex field with its own set of design considerations, rules and theories. It will undeniably play an important role in the future of all technology based fields.

References/ Acknowledgments

This paper was prepared from many books and documents read by the author over the last couple of years or so. In particular the following references were found to be useful.

DSP CARD 3 Beta version documentation by Kaj Wiik, OH6EH and Jarkko Vuori, OH2LNS, Alef-Null International 4-9-1991.

Motorola Corporation Data Sheets and Application notes for that company's range of DSP products.

PC-DSP by Oktay Alkin (Prentice Hall), an excellent combination of a textbook and PC software disk that lets you do many DSP functions on your PC and plot graphs of the results etc.

As an aside, if you are considering purchasing books on DSP and related subjects I would counsel you to read them a bit first, particularly if you're not all that mathematically inclined. Many texts, quite reasonably, use mathematical proofs and calculus to get the point across. If you don't understand the maths I've found the point is easily lost. ar

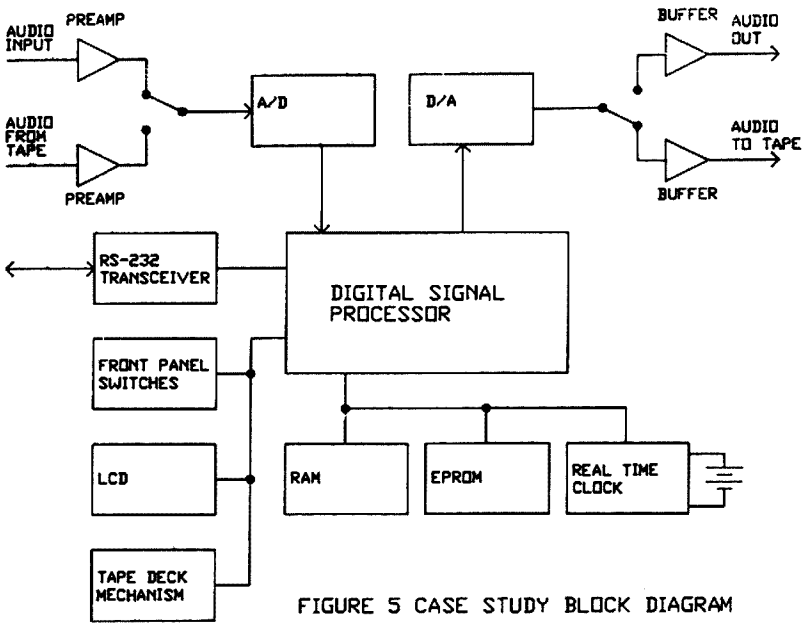


FIGURE 5 CASE STUDY BLOCK DIAGRAM

Club Corner

Moorabbin and District Radio Club

Amended Rules for the M&DRC Award.

The scoring system for the club's very attractive award has been amended by the allocation of three points for a contact with one of the club's life members.

The complete details of the award are as follows:

1. This open award is available to any licensed amateur who has submitted evidence of two-way contacts with M&DRC station VK3APC and/or member stations (identifiable by call sign); and to any SWL who submits evidence of having heard contacts between amateurs and members stations.
2. Contacts may be made on any band and any mode.
3. The Award is issued on a point scoring system; Club Members — 20 points required; Non-Club Members — 15 points; SWLs eight (8) points; Overseas Stations five (5) points or one (1) contact with the Club Station VK3APC.
4. Awarding of points is based on the following schedule; for each contact.

	Mode of Contact			
Station	Phone	CW	Packet	RTTY
VK3APC	5	10	7	5
M &DRC Member	1	5	5	4
Life Member	3			

Stations may only be worked once per band, per mode. A separate award may be claimed for each mode qualified for.

5. Contacts made as from 1st June 1983 are valid for Award points.
6. Proof of contact to be by log extract showing date, time (UTC), call sign of station worked, frequency, mode of emission, signal report, and points claimed.
7. Applications for Award to be sent to : Awards Manager
   PO Box 58
   Highett Vic 3190
   together with a fee of $3-00.
8. The M&DRC holds a regular club net on 3.567 MHz each Monday night at 8.00 pm local time.

Allan Doble
VK3AMD
ar

CONTESTS

Peter Nesbit VK3APN — Federal Contest Coordinator
24 Sovereign Way, Avondale Heights, 3034.

Contest Calendar Mar-May 93

Rules are in the indicated issue.

Mar 6/7	ARRL DX SSB Contest	(Feb 93)
Mar 13/14	BERU CW Contest	(Feb 93)
Mar 20/21	John Moyle Field Day	(Feb 93)
Mar 20/21	BARTG RTTY Contest	(Mar 93)
Mar 27/28	CQ WPX SSB Contest	(Mar 93)
Apr 1	Poisson d'Avril Contest	(Mar 93)
Apr 3/4	SP DX Contest	(Mar 93)
Apr 9/11	Japan DX CW Contest	(Mar 93)
Apr 10/11	"King of Spain" DX Contest	(Mar 93)
Apr 17/18	SARTG AMTOR Contest	(Mar 93)
Apr 24/25	Swiss Helvetia Contest	
May 1/2	ARI (Italy) Contest CW/SSB/RTTY	
May 8/9	CQ-M Russia Contest	
May 29/30	CQ WPX CW Contest	(Mar 93)

BARTG RTTY Contest

This contest is sponsored by the British Amateur Radio Teleprinter Group, and runs from 0000z Saturday to 2400z Sunday, 20/21 March 1993. The object is to work as many amateurs worldwide as possible, on RTTY, on 3.5-30 MHz (WARC bands excluded).

Categories include single operator, multioperator, and SWL. Operation is limited to 30 hours out of the 48 hour contest period. Exchange RST plus a 3 figure contact number and time in GMT (full four figures). SWLs must show the call of the station heard, report of message sent, and call of station being worked.

Score 1 point per contact. Multipliers are the total number of countries worked on each band, and the number of continents worked on all bands (counted once only). Call areas within W/K, VE/VO, and VK each count as separate "countries", and continents are as defined for WAC. The final score equals QSO points x country multiplier × continents.

Use a separate log for each band, and include a summary sheet showing call, name, address, category, score, declaration, etc. Send logs to be received by 24 May to: John Barber G4SKA, 32 Wellbrook Street, Tigerton, Devon, EX16 5JW, England.

CQ WPX Contest

This contest is sponsored by CQ Magazine, with SSB on 27/28 March, and CW 29/30 May 1993. The contest runs from 0000Z Saturday to 2400Z Sunday, and the objective is to contact as many stations worldwide as possible on 1.8-30 MHz (except 10, 18 & 24 MHz).

Categories include: single operator (either single or all band), subdivided according to power (unrestricted, low power max 100W O/P, and QRPp max 5W O/P); and multioperator (either single or multitransmitter, all band only). Single operator stations are where one person performs all operating, logging, and spotting functions. The use of DX spotting nets places the station in the multioperator single transmitter category. Multi-multi stations must have all transmitters located within a 500m diameter circle or within the property limits of the licensee's address, whichever is greater. All antennas must be physically connected by wires to the station transmitters and receivers.

Exchange RS(T) plus a 3 digit number starting at 001. Continue to 4 digits if past 1000. Multitransmitter stations must use separate numbers for each band.

Score 3 points (14-30MHz) or 6 points (1.8-7MHz) for contacts with stations on different WAC continents, and 1 point (14-30MHz) or 2 points (1.8-7MHz) for contacts with stations within the same WAC continental boundary. Contacts with stations in the same country are permitted for multiplier credit but have zero point value.

The multiplier is the total number of prefixes worked on all bands (each prefix is counted only once regardless of the number of different bands on which it is worked). A "prefix" is the letter/numeral combination forming either the first part of the callsign, or else the normal country identifier for stations using their home callsigns in another DXCC country. For example: N8, W8, AG8, Y22, Y23, HG7, HG73 are all separate prefixes. The prefix for both N8ABC/KH9 and KH9/N8ABC is KH9. Portable designators without numbers will be assigned zero after the letter prefix, eg N8ABC/PA becomes N8ABC/PA0. Any calls without numbers will be assigned a zero after the first two letters, eg RAEM becomes RA0EM. Suffixes to indicate maritime mobile, mobile, portable, alternate location, and licence class do not count as prefixes (eg /MM, /M, /P, /A, /E). The final score is QSO points × multiplier.

Logs must show times in GMT. Show prefix multipliers only the first time they are worked. Logs must be checked for duplicates, correct points, and prefix multipliers. Logs must be accompanied by a sorted alphanumeric list of prefix multipliers, and a summary sheet showing call, name, address, category, scoring information, and a signed declaration that contest rules and radio regulations have been observed.

Logs may also be submitted on 3-1/2 or 5-1/4 DOS disk in ASCII format (.BIN, .RES, .DBF, .WKS also acceptable), providing a written summary sheet is included.

Send logs postmarked by 10 May (SSB) or 9 July (CW) to: WPX Contest, 76 N. Broadway, Hicksville, NY 11801, USA. Indicate SSB or CW on envelope.

A comprehensive range of trophies and plaques is offered, and certificates will be awarded to the highest scoring station in each category, country and VK call area. To be eligible for awards, single operator stations must show at least 12 hours operation, and multioperator at least 24 hours operation. Single band entries showing more than one band will be judged as multiband unless otherwise specified. Where returns justify, 2nd and 3rd place awards will also be made.

Poisson d'Avril Contest

Sponsored by the French organisation Legion International des Omelettes avec Oignons et Fromage, this old classic runs on Thursday 1 April from 0000 to 1954z. The purpose is to promote the humorous use of amateur radio for international goodwill.

All present regularly issued licensees, friends, and other licensed stations may take part. Exchange RS(T), serial number (actually any number you want), QTH (yours or that of anyone you choose), and birthdate (yours).

Stations may be worked on all bands as many times as possible, but only once per QSO. Count one point for each station heard, worked, or imagined. Bonus points may be claimed for working any amateur whose picture appears on the cover of an amateur radio magazine. Extra bonus points for making at least one QSO without using commercial, generator, nuclear, fossil fuel, battery, solar, chemical, biological, thermoelectric, or similar power sources. Other arbitrary bonus points may be claimed.

Every station worked or heard counts as a multiplier. Exception: Stations in Washington DC do not count as multipliers unless they have flown aboard the Space Shuttle. Stations contacted whilst on board the Space Shuttle count for Washington DC.

Suggested frequencies are 3526, 7025, 14025 (CW), and 3650, 3799, 7095, 14220 (SSB). The usual frequencies apply for other modes eg RTTY, AM/FM, SSTV, Packet, AMTOR, and telepathy.

Categories include single operator unassisted, single operator assisted, single operator multitransmitter, multioperator no transmitter, QRP, QRO, and really QRO. Clubs may claim any known participant without the usual meeting attendance requirement, in fact the existence of an actual club is not necessary.

Logs may be submitted on computer disk in anything except the standard contest format; 1GB optical R/W drive with warranty in factory sealed box preferred. All entries must include a signed declaration that the rules of the contest were obeyed at least once. Logs must be postmarked by 15 April 1993, and sent to: P d'A Contest Committee, 144 Kendall Pond Road, Windham, NH, USA 03087. Include SASE for results.

Awards will be made based on score, entry creativity, and amount of cash enclosed with the log. The decisions of the judges are arbitrary and final.

SP DX Contest

Held on the first full weekend of April, this usually has a good level of SP activity. Dates/times for 1993 are 1500Z Saturday to 2400Z Sunday, 3/4 April.

Classes include single operator, single and all band. Bands are 160-10m (no WARC bands). Send RS(T) plus serial number; SPs will add a 2 letter province code. Score 3 points per QSO with each Polish station, and obtain the final score by multiplying by the number of provinces worked (max 49).

Send log to arrive by 5 May to: Polski Zwiazek Krotkofalowcow, Contest Committee, Box 320, 00-950 Warsaw, Poland.

Japan DX CW Contest (High Band)

Running from 2300Z 9 April to 23z 11 April 1993, the object is to contact as many Japanese stations as possible on 14, 21 and 28MHz CW.

Classes include single operator (single and multiband), single operator QRP (5W max O/P), and multioperator single transmitter. Send RST plus CQ zone number; JAs will send RST plus prefecture number (01-50). Score 1 point per JA QSO on 14 & 21 MHz, and 2 points on 28 MHz. Points are doubled for QSOs with QRP stations (QRP stations must send /QRP). The multiplier equals JA prefectures + Ogasawara Isl (JD1) + Minami-Torishima Isl (JD1) + Okino-Torishima Isl. Rest breaks totalling 18 hours must be taken and clearly shown in the log.

Send log postmarked by 31 May to: Five-Nine Magazine, Box 59, Kamata, Tokyo 144, Japan.

"King of Spain" DX Contest

This contest runs from 18z Saturday 10 April to 18z Sunday 11 April 1993, 80-10m (no WARC), SSB and CW (these are separate contests requiring separate logs). Classes are single and multi-operator, multiband only.

Send RS(T) plus serial number; Spanish stations will send RS(T) plus province letters. Score 1 point per QSO with each Spanish station on each band. The multiplier is the number of Spanish provinces worked.

Send logs to be received by 28 May to: URE Contest Manager, PB220, 28080 Madrid, Spain.

Provinces are: EA1: AV BU C LE LO LU O OR P PO S SA SG SO VA ZA; EA2: BI HU NA SS TE VI Z; EA3: B GE (or GI) L T; EA4: BA CC CR CU GU M TO; EA5: A AB CS MU V; EA6: PM; EA7: AL CA CO GR H J MA SE; EA8: GC TF; EA9: CE ML.

SARTG WW AMTOR Contest

This one is sponsored by the Scandinavian Amateur Radio Teleprinter Group, and runs at the following times: 0000-0800Z & 1600-2400Z Saturday 17 April, and 0800-1600Z Sunday 18 April. Classes are single operator (all/single band), multi-single, and SWL.

Only AMTOR is allowed. Use FEC for calling CQ, and ARQ for contest exchanges. Exchanging messages in anything other than ARQ is not allowed and will be grounds for disqualification.

Exchange signal report, name, and serial number starting at 001. Score 5 points for QSOs with the same country, 10 points for QSOs with other countries within the same WAC continent, and 15 points for QSOs with other continents. Each DXCC country worked on a new band counts for a multiplier. VK/VE/W/JA call areas are considered separate countries for the purpose of QSO points and multipliers. Final score is total QSO points × total multiplier.

Send entries postmarked by 9 June to: SARTG Contest Manager, SM4CMG, Skulsta 1258, S-710 41 Fellingsbro, Sweden.

Results of 1992 ARI International DX Contest

The 1992 contest was well patronised, with activity from some of the more exotic locations in Africa, Asia and South America. Australia was represented by two stations, both winning certificates:

CALL	MODE	QSOs	MULT	SCORE
VK2APK	CW	645	133	322525
VK5PMC	SSB	14	11	1463

73 VK3APN

Ross Hull Memorial VHF-UHF Contest, 1992-1993, Results

by John Martin VK3ZJC

Once again there was no really outstanding propogation during the contest. In my location there were several good openings to Adelaide, and marginal ones to VK6. The most notable contacts made during the contest were on 1296 MHz, from VK2DVZ to ZL1AVZ, and a new Queensland record for VK4KZR and VK4OE/2.

Some of the contest "regulars" — especially on the microwave bands were absent this year, and their ability to dole out points was sorely missed! Despite this, participation was higher than last year, especially on 2 metres. It was pleasing to hear a number of stations which I had never — or hardly ever — heard before.

Contest activity on 6 metres was quite low, partly due to conditions and partly due to the 10 point scoring limit. I do not see this as a problem — most 6 metre operators are more interested in chasing DX than collecting contest points anyway!

Again this year I logged a number of interstate stations whose calls went unanswered because of local QRM on calling frequencies. It was also disappointing to miss a few "juicy" contacts due to locals nattering or testing on 1296.1 MHz. I must say again: DX calling frequencies are not the place for local contacts, deaf receivers, FM-only receivers, vertical antennas, or test transmissions.

Logs were well presented and very easy to check. Several entrants will find that their points score has been altered. In every case this was due to underestimates of distance or errors in adding up the totals — and in every case the entrant has gained from the correction.

Results

Now down to business. Roger Steedman, VK3XRS, has won the trophy for the third successive year, with the top score on all but three bands. Gordon McDonald, VK2ZAB, wins 2 metres with a superb score. Ian Berwick, VK3ALZ, takes out 2.3 GHz and Wal Howse, VK6KZ, likewise for 10 GHz. Congratulations to all.

Next Year

Several entrants commented that scoring was complicated by the 1800 UTC start to each contest day. The idea of the 1800 start was to shift activity from the mornings to the evenings. On checking the logs I cannot see that it has made much difference, so it could be best to go back to the 0000 UTC start.

I will also look into possible changes to the 6 metre scoring so that long distance scatter contacts can be better rewarded.

There was some complaint about the need to keep separate totals for each band. The purpose of this was so that awards could be made to the top scorers on each band as well as to the overall winner. By nominating different days on different bands, entrants can claim the highest possible score on each band as well as the highest aggregate.

I am reluctant to drop the band-by-band scoring, because it would mean less incentive for people who prefer to concentrate on one or two bands. There should be no problem in making separate totals — the easiest way is to have a separate score column for each band, and a "master sheet" where the daily totals for each band can be entered. At the end of the contest it should then be easy to pick the best seven figures in each column.

Christmas Day 1993 will fall on a Saturday, so I am undecided as to whether it would be better to shorten the contest by one day and start on Boxing Day. This would avoid the possibility of frustration, guilt feelings or family conflicts on Christmas Day!

VHF — UHF Field Day 1993

Due to the problems with the delivery of "Amateur Radio", some entrants may not have received enough notice of the rules and the deadline for logs, which was earlier than last year's. I feel the only fair thing is to extend the deadline to the end of March and publish the results in the May issue

73, VK3ZJC

1992 VK/ZL Oceania DX Contest

John Litten ZL1AAS

I have just finished checking the logs submitted in the VK and ZL sections. Who said CW was dead? In this time of difficult propagation conditions, just take a look at the leading scores.

Call	Name	6 m	2 m	70 cm	23 cm	13 cm	3 cm	Total
VK3XRS	R. Steedman	964	2328	2114	1190			6596
VK6KZ	W. Howse	215	1816	1743	160		96	4030
VK2DVZ	R. Barlin		2538	534	470			3542
VK2ZAB	G. McDonald		3488					3488
VK3CY	D. Clarke		2244	1232				3476
VK5AKK	P. Helbig	161	1864	1337	80			3442
VK3AFW	R. Cook		1488	1288	600			3376
VK3DLM	L. Mostert	458	1236	1078				2772
VK3AUI	G. Sones		140	920	903	540		2503
VK3DEM	R. Ashlin		1028	671	200			1899
VK3ALZ	I. Berwick	155	538		440	26		1159
VK3ZJC	J. Martin				920			920
VK2XMD	M. Erskine	518	320	7				845
VK3AEX	R. Antosiewicz	20	244					264
VK2NJ	I. Thomas		204	14				218
VK6BWI	P. Parker		152					152
VK4GWC	G. Combes		28					28

I do not recall when a score of over 2 million points was last achieved. Congratulations are due to Peter, ZL3GQ for this magnificent effort (by the way, his computer generated log was a joy to check). First place overall in the Phone section, and runner-up overall in the CW, is well known and long-time contest entrant, VK2APK. Congratulations Dietmar.

As I usually do, I have prepared the results to show the individual band scores, as well as the All Band total.

Some entrants may find that their score has altered, but in most cases, this has been due to mathematical errors in their calculations. Again the comment I hear from overseas ... where are all the ZLs?

The results in the Overseas section will, of course, be some months away.

Some comments from contestants I enjoyed the non-stop 80m. pile-up which followed the sunrise from USA East coast to West coast ... ZL3TX.

I was slightly disappointed by the number of VK/ZLs who were prepared to give me a number, but could not be bothered with joining the contest ... VK8AV.

My first serious attempt at a 24 hour test, and enjoyed it ... VK5AFO.

Better propagation, and a few extra watts "up the stick" would have helped ... VK2ARJ.

Would be nice if there were sections for Novice and single band operations, but all in all, a good 24 hour contest ... VK2PWS. Conditions reasonable across the bands, but where were all the VKs and ZLs on 160 and 80 metres? ... ZL1AIZ.

A most enjoyable contest with excellent decorum, and a credit to the great majority of "Brass Thumpers". Who said Morse was under threat? ... VK5AGX.

As usual a very good contest and most enjoyable despite limited time on the air. Been in it for many years and hope to be there next year ... VK4OD.

Enjoyed the contest. Lots of fun ... VK4OR.

It is the WIAs turn to organize this contest for 1993, so I will look forward to meeting you all again soon.

1992 VK/ZL Oceania DX Contest — Australian Results

	160m	80m	40m	20m	15m	10m	TOTAL
VK Phone Results							
VK2APK	2000	17000	38000	59334	98530	31488	1554293
VK2AYK	2500	1280	900	63336	34322	4896	456148
VK2ARJ	60	770	20	8640	966	585	46996
VK2CJH	1080	2340		81			13209
VK2PS	2000	540		2200	1716	48	52530
VK2PWS					100806	76230	356963
VK2XT					14784		14784
VK3DRX	3920	1530					10950
VK3DZM		268800					268800
VK3ENX		10	45		1450		2407
VK3SM				812			812
VK4DMP		3420	100	1156	132354	144	263097
VK4NEF		630			58088	3	74965
VK5AFO	1600	6290	180	7275	6956	3648	195480
VK5PMC		1710			38760		59500
VK6WJH		5400	5	1292	13020		84851
VK8AV		1710	20	11656	116564	29475	491381
VK8BE					646		646

Check Logs: VK3OOF, VK5OE

	160m	80m	40m	20m	15m	10m	TOTAL
VK CW Results							
VK2AIC		660		754	828	336	13166
VK2APK	1200	54870	209820	64264	37800	8832	1872520
VK2DID		3840	25665	10664	6750		195494
VK2PS	800	2090	2520	6298	680	504	85918
VK2KM	560	13120	112690	924	26732	1650	554554
VK9NY/2			107800	36207	12198	3192	533544
VK3DRX	640	880					3240
VK3KS				342			342
VK3VB	180	1900	15	1120	684		22308
VK3XB		160		6633	288		13529
VK4LV		840		1677	4056		19497
VK4OD				9594		2574	23328
VK4OR		600	405	8346	2400	1173	56980
VK4TT				129564			129564
VK4XA						129213	129213
VK5AGX					55176		55176
VK6BB		120	18460	4575	41128		190476
VK6HG		910	8800	23128	30940	3402	286396
VK61V			6600				6600
VI6ZH			18975	48199	135026	9798	707229
VK7RY		1530	150	272	8		7072
VK8AV	160	490	54810	68056	73200	56238	1168512
VK8BE					576		576

SWL Section

VK3 SWL Jon Finn	5000
VK6 SWL Peter Kenyon	42048

ar

IARUMS — Intruder Watch

Gordon Loveday VK4KAL Federal Intruder Watch Co-Ordinator
Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4UN

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. The main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

The most persistent intruders being observed are from the CIS [formerly USSR]. Stations identifying as UMS are controlled from Moscow Naval Radio on 21031.5, mxd modes, A1A/F1B, 200/250 Hz. A careful check should be kept on 21448 A3E. This was recently signing Radio Moscow, but possibly now identifies as Radio Armenia. It usually has a lot of splatter associated with it.

As from 1st October 1992, Radio Beijing on 24.950 MHz has been using the call sign "China Radio International", retaining former ID for local services, but keep an ear open. No change expected either with removing harmonic or ID. Many more pulse and carriers are being observed over the last few months, some more time is indicated, for a possible callsign.

The VK end of IARUMS is still looking for Co-ordinators for VK3 and possibly VK2, as no reply has been forthcoming from that Division. The IWS is not restricted to male domination, I am sure there must be YL operators more than capable of doing the job. The Service, suffers to some degree, by not being fully staffed. How about it "girls"?

STOP PRESS

On behalf of the Region 3 Co-ordinator ZL1CVK, I wish to thank all participants in the recent Beacon Survey. In VK we had a "strike rate" of 100%, 15 reports in all. To my knowledge no one opted out, your efforts are much appreciated. Can we get the same "strike rate" with our normal IW logs?

73
Gordon
ar

Awards

John Kelleher VK3DP Federal Awards Manager

Swedish Awards

I recently received a copy of the official Swedish Awards Program from the Sveriges Sandareamatorer (SSA).

Heard all Sweden Award (HASA)

The HASA will be issued to all listeners (SWLs) for verified reports of stations in Swedish lans and call sign districts for contacts made after 1st January 1988.

The award is issued in the classes and groups corresponding to the rules for the Worked All Sweden Award (WASA).

Plaques will however not be issued for the HASA.

Swedish Locator Award (SLA)

The SLA will be issued to licenced radio amateurs for verified contacts made with the various locator squares in Sweden, as defined by the Maidenhead system, for contacts made after 1st January, 1988.

The award is also issued to listeners (SWLs) on an equivalent basis.

All amateur radio bands may be used.

Endorsements can be obtained for individual bands and modes.

Requirements

Basic Award 25 Squares
Stickers 35, 45, 55, 60, 61, 62, 63 and 64 squares.

General

The SSA Awards Programme is available to all licensed radio amateurs and SWLs worldwide, who are members of their country's IARU affiliated radio society *(ie for Australian amateurs and SWLs, members of the WIA — VK3UV Prod Ed).*

All contacts shall have been made from the same country.

Contacts with earth-based repeaters are not valid.

All contacts shall be verified with QSL cards or equivalent, on which there is sufficient information which is required for approval.

Instead of sending in QSL cards, overseas applicants may get their cards checked by an official of their National Society.

Fees

A fee is charged per award and is to accompany each application.

Basic Award	6 IRC
Sticker	1 IRC

All applications shall be sent to Sveriges Sandareamatorer, Ostmarksgatan 43, S-123 42 Farsta, Sweden.

DXCC Profiles — Bill Hempel VK4LC

Prior to 1957, Bill was an RAAF officer. He retired to take up farming at Kyabram, in Victoria. Later he joined the Public Service, and held responsible positions in Canberra. He was Federal Awards Manager on two occasions, his way of putting something back into the hobby which he enjoyed so much. In 1962 he was first to operate SSB from Wallis Island as FK8BH, later to Nauru (VK9BH), Ocean Island (VR1N), New Hebrides, now Vanuatu (YJ8RH), and Portugese Timor (CR8BH).

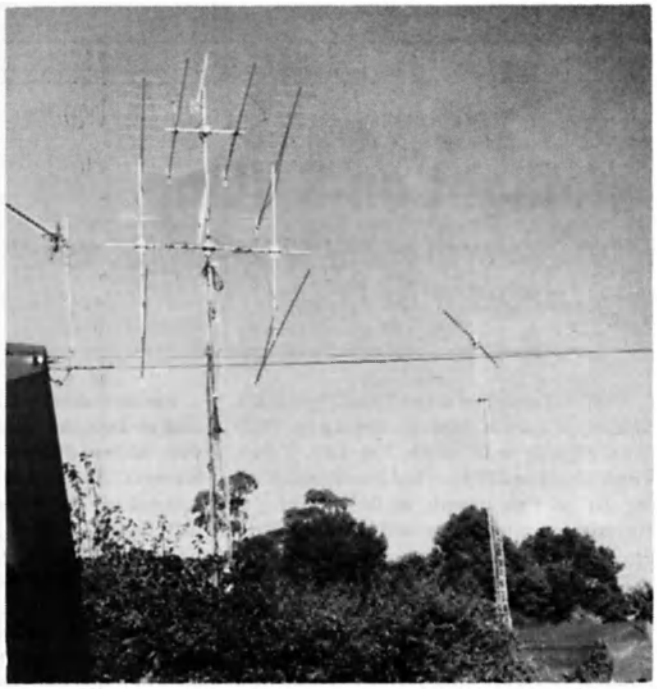
After Bill retired as Parliamentary Liaison Officer (Defence), he moved to Mount Tamborine, Queensland, an ideal HF and VHF location, (using the latter to advantage on 432 and 144 MHz). He now looks to working satellites, and the occasional shuttle operation.

His personal advice to others is similar to those already published:

1. Listen, listen, listen.
2. Exhibit patience, and show consideration to others.
3. Always be sure that your equipment, including antenna systems, are in good operating condition.
4. Don't operate outside your own limitations.

Note: During the early 1950s, I had the pleasure of associating with Bill, as a fellow RAAF operator, at School of Air Navigation, East Sale, flying in Lincolns and Dakotas. When I arrived there, as a "new boy", he was the first to offer a helping hand.

Bill Hempel VK4LC

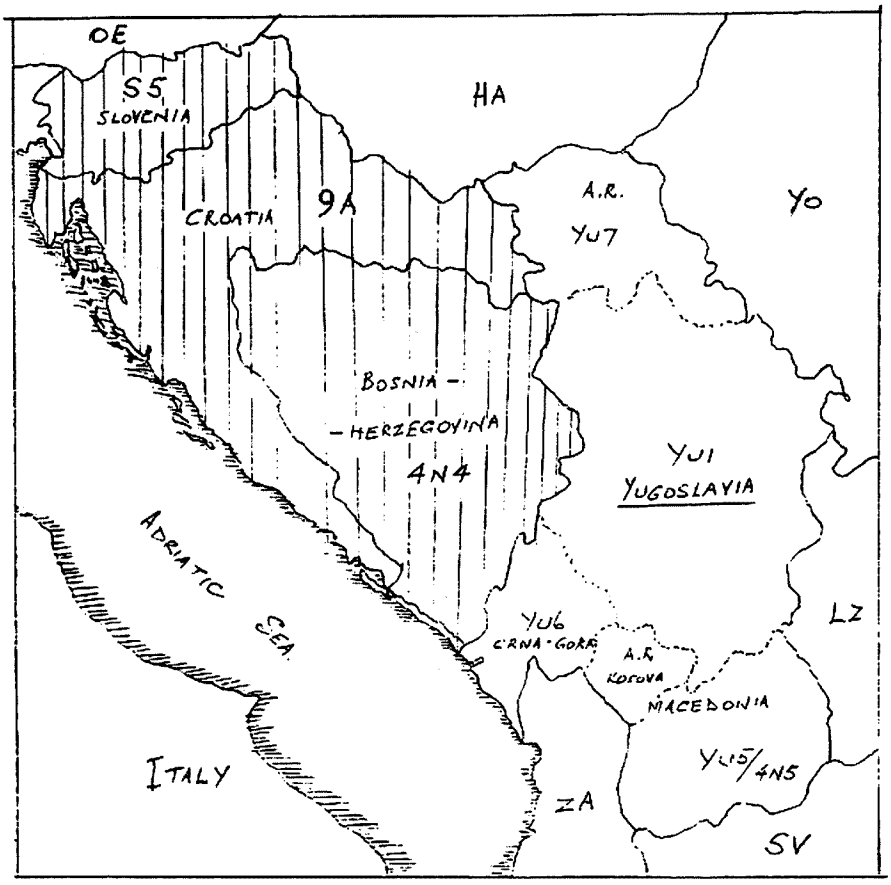


Bill VK4LC's extensive antenna system at Mount Tambourine.

Blunder

Production Editor's Note — In last month's Awards Column, (page 59) reference was made to a map of the new Slovenia, Croatia and Bosnia-Herzegovina countries. Regretfully I must have been away with the fairies on the day of putting the magazine to bed, as the map was accidently omitted. The map is published hereunder. Apologies to all — VK3UV.

ar



Spotlight on SWLing

Robin L Harwood VK7RH 52 Connaught Crescent West Launceston Tas 7250

Well, Autumn has arrived and signals are coming in earlier now on the Long Path from Europe and North America. Don't forget that the M93 period commences on the 1st of this month at 0100z, yet the majority of alterations will take place on the 28th, when continental Europe goes on to Daylight Saving.(Incidentally, we go off Daylight Saving on the same date in VK7.) Most international broadcasters generally make significant alterations now on the last Sunday in March and September, instead of the first.

Radio Netherlands had hoped to commence relaying their programming from sites in the Commonwealth of Independent States (CIS) as from January 1st. However, a combination of weather and technical difficulties held it back until the 1st of February. At 1030 UTC, a very good signal from Irkutsk, Siberia was heard on 9850 kHz with English to Asia. On 7260 kHz, the same program was heard, although 600 milliseconds behind Irkutsk. Signal strength was fair and frequently subject to heavy QRN and splatter. This sender is at Petropavlovsk, on the Kamchatka Penisula and is for the Far East. It goes off at 1125, while 9850 kHz continues in Indonesian from 1130z. I believe that Radio Netherlands via the CIS is on for up to 17 hours daily.

The new Catholic owned "Eternal Word Network", based near Birmingham, Alabama, which operates Radio WEWN, has run into serious problems. Firstly, the community didn't take too kindly to the erection of antennas and associated power lines spoiling the view etc. Then, when the transmitter started up on the 27th of December on 7465 kHz, it caused severe RFI problems to the residents, who couldn't utilise their phones or receive domestic radio and television programming, plus locking up the Birmingham Police Two Way on 159 MHz.

Also, there are rumours that funding that they were hoping for, may have fallen through. After only a few days, the sender was closed down and WEWN hasn't been heard since. When it was heard here, reception was very poor on 7465 due to heavy QRM from an Australian utility with Frequency Division Multiplex (FDM) service two kHz down.

Radio Australia has commenced a special service to Somalia on 25750 kHz between 0800 and 0900 UTC. It includes a special program specifically for the Australian troops there plus the normal Radio Australia programming.

Here is the schedule for the Voice of America's English Transmissions to Asia and the Pacific, as received on the local Packet BBS from IW1PRT. It is current till 27th March.

0000-0030 7120-9770-11760-15185-15290-17735-17820
0030-0100 7120-9770-11760-15185-15290-17735-17820
1000-1100 5985-11720-15425
1100-1200 5985-6110-9760-11720-15155-15425
1200-1230 6110-9760-11715-15155-15425
1230-1330 6110-9760-11715-15155-15425
1330-1400 6110-9760-15155-15425
1400-1500 6110-9645-9760-15160-15425
1900-2000 9525-11870-15180
2100-2200 11870-15185-17735
2200-2400 7120-9770-11760-15185-15290-15305-17735-17820

Well, that is all for March. Until next time, the very best of monitoring and 73 — VK7RH.

ar

Repeater Link

Will McGhie 21 Waterloo Cr Lesmurdie 6076 VK6UU@VK6BBS

Perth Pagers

Access to a spectrum analyser prompted me to connect an aerial to it and have a look at the pager band just above the two metre band. What a sight, wall to wall pagers. The accompanying drawing is a 30 second sample of pager activity. At any instant about half of the pager transmissions shown are on air. The spectrum analyser has a delayed persistence capability and allows a time lapse picture to be built up. This drawing is the result.

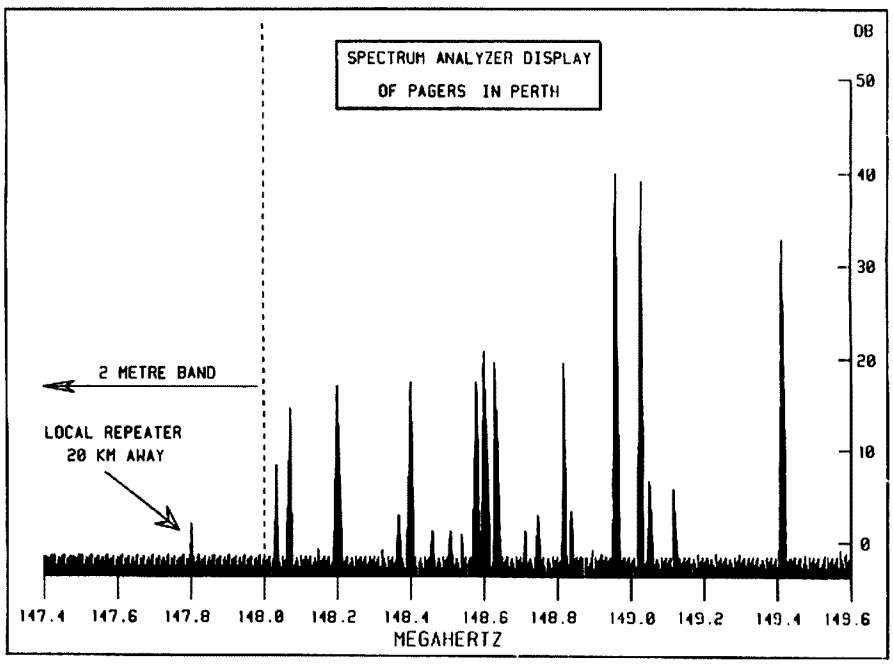
The pagers were received on a quarter wave whip about 10 metres high and a couple of kilometres from the centre of Perth. The strongest pagers shown are located in the Perth city area, the others, unknown distances away.

Note the amateur repeater signal shown. This repeater is VK6RAP located about 25 kilometres away. The frequency of the repeater shown is not correct, I moved it up the band for ease of representing it on the drawing.

The vertical scale is in dB and shows what your receiver has to contend with in the inner city area; signals 40 dB stronger than the amateur repeater signal. It is little wonder that many amateur two metre receivers have intermod problems in such a strong signal environment.

Looking at these pager signals coming and going over a period of time on the spectrum analyser, demonstrated how clean they are. No spurious signals at any time including the critical switch on and switch off times. Blaming dirty pager transmissions for our problems on two metres could be largely dismissed as a waste of time. Any piece of technology can fail but if you are having problems with pager transmissions then suspect your receiver long before the pager transmitter. How the decision to place high power high density transmissions so close to our two metre band was arrived at will never be known, but wouldn't you love to have been there to find out. Maybe we were never mentioned, maybe no one knew that an amateur band existed from 144 to 148 MHz. By the way I'm not knocking pagers as such. The technology is great, and the purpose they serve very useful. Does any one know where the rest of the world puts their pagers? Are we the only country with them right up against 148.000 MHz? If you know please let me know, I'm curious.

Also I would like to know how to spell ANALYSER or is it ANALYZER?



Production Editor's Note

1. *Pagers — Please refer to last month's issue, for our Federal President's (Ron Henderson VK1RH) most interesting comments.*
2. *Analyse/Analyze — So would I Will!, the spell checker on our Word Processor (WP51) tells me that "ANALYSE" is valid, but our copy of Heinemann's Australian Dictionary shows both are correct. Of course the word "analyse" or "analyze" is a verb, and as both are correct in this sense, one would assume the conversion to a noun would also be correct. Bill VK3ABP didn't help much by claiming "analyzer" to be American spelling and "analyser" to be British, so either may be correct depending on which convention you wish to follow. I guess we will have to await more profound discussion from our correspondents. In the meantime, I will just put it down to one of those "amateur conundrums", and leave our readers with the choice of either ... VK3UV.*

ar

Stolen Equipment

YAESU FT209RH with Broken battery clip and a large scratch on back near belt clip. Details to VK6KAD.

YAESU FT230R two metre FM mobile rig, Serial No 2M120897, stolen from vehicle in Church St, Rozelle, NSW, between 8.00am and 5.30pm on 10 Feb 1993. Reward offered for return. Details to Balmain Police, and Colin Christie VK2JCC, QTHR (02) 476 2651.

ar

ALARA

Robyn Gladwin VK3ENX Box 438 Chelsea 3196@VK3YZW

The main news for the next few months will be the progress of plans for the ALARAMEET in Castlemaine, Victoria, 1, 2, 3 October, 1993.

There are 64 names to date, 31 ALARA members. Nine rooms have been provisionally booked at the Castle Motel and the $20 deposit for motel rooms is now required.

A suitable venue for the weekend has now been found and catering arrangements have been finalised already.

Proposed Activities

Friday: Meet 6.30 pm for evening meal (optional).

Saturday: Check-in from 9.30 am Welcome 11 a.m. Lunch 12 noon. Guided tour(s) 1.30 to 4.30 pm. Dinner 6.30 pm followed by social evening.

Sunday: Meet 9.15 am Tour(s) morning tea included. Lunch 12.30. Wind up official program. For those staying on, a further tour could be arranged if required.

The ALARAMEET Co-ordinator, Margaret Loft, VK3DML, is looking forward to hearing from anyone still hoping to attend. She will accept bookings until September BUT accommodation may be a problem later in the year. Her address is 28 Lawrence Street, Castlemaine, Victoria, 3450.

March and April are important months for contests arranged by DX YL organisations.

CLARA & Family HF Contest

Tuesday, 16th March 1700 UTC to Wednesday, 17th March 1700 UTC.

Open to all licensed amateurs, SSB and CW modes. Use all HF bands.

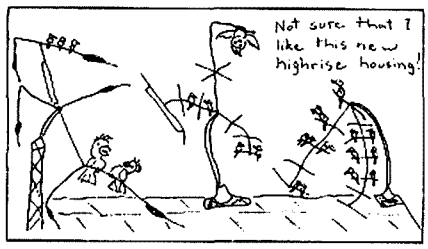
Single operator stations only. Each station may be contacted once in each mode. Logs are to reach the Contest Manager no later than 31st May, 1993.

Contest Manager: Janis Cameron, VE7AAP, 3528 11th Avenue, Port Alberni, BC. V9Y 4Y7. Canada.

WARO Thelma Souper Memorial Contest 1993

Saturday, 3rd and Sunday, 4th April, 0700 to 1000 UTC each day.

80 metres only, phone and/or CW. YLs contact YLs and OMs, OMs contact YLs only. One contact with each station in each



half hour period is permitted. To qualify as a multiplier, WARO member stations must have contacts with at least 20 different stations. Bonus station using WARO callsign ZL2YL counts as a multiplier once each night. Logs to reach Contest Manager, Chris Armstrong, ZL1BQW, PO Box 209, Kawerau. BOP New Zealand, no later than 6th May, 1993.

DX-YL to North America YL Contest

24 hours maximum operating time with no breaks.

CW: 1400 UTC Wednesday, 14th April, to 1700 UTC Thursday, 15th April.

SSB: 1400 UTC Wednesday, 27th April, to 1700 UTC Thursday, 28th April.

Logs, postmarked within 30 days of the contest, to be sent to Carla Watson, WO6X, 473 Palo Verde Drive, California 94086 U.S.A.

Thank you to Dorothy Bishop, VK2DDB, for this month's cartoon.

33

ar

Silent Keys

The WIA regrets the passing of :

L	Carras	L20754
R (Robert)	Roach	VK2ARI
J V (Jack)	Clifford	VK2DDN
C V (Claude)	Smeal	VK2DXO
B (Bert)	Saunders	VK2FDM
L P (Lester)	Gerity	(ex) VK2KT
R E	Barlow	VK2PPU
K R C (Kenneth)	Lawson	VK2PYP
F (Fred)	Taylor	VK3CFT
C (Charlie)	Case	VK4IQ
K J	Cahill	VK5KC
L A (Alyn)	Maschette	VK6KWN

Obituary

Due to increasing space demands obituaries should be no longer than 200 words.

Harry Hocking VK2HH

It is with regret we record the passing of Harry Hocking VK2HH on 9 December 1992 at the Calvary Hospital, Kogarah, after a short and sudden illness, at the age of 72 years.

Harry trained at the Marconi School of Wireless in Sydney, then made his career as a professional radio officer. First serving a few years in the Merchant Marine in WWII before being appointed by Qantas as an RO, flying first in Catalina then Sunderland flying boats.

He continued this career through various Qantas aircraft until the use of radio officers was discontinued with the advent of the 747.

Harry continued on ground-based training duties, but with many interesting flights to evaluate new radio systems.

Claude Vincent Smeal VK2DXO

Claude passed away on 1/1/93 at the age of 74 years following a long illness, leaving behind his devoted wife Kathy and three daughters, in addition to many friends.

He was in the Permanent Army for 35 years, rising to the rank of Lieutenant Colonel. He served in the South West Pacific and Darwin during the 1942 raid.

During the period 1951-1954 he was Battalion Signals Officer in Korea and, without being able to train, he completed the distance in the 1952 Helsinki Olympic Marathon; also he had three years in administration at an atomic weapons testing site, and five years administration at Williamtown with the Parachute Battalion, making his first jump at age 44. He was also a Legatee at Newcastle.

He gained his AOCP in 1979 despite suffering a stroke in 1977, joining the Coral Coast Guard in June 1990.

With Kath, he travelled in their mobile home extensively, visiting many of the group's members and other friends in Queensland and northern NSW.

Our sympathy is extended to Kath and his daughters, and we will remember his Olympic spirit and the very strong desire to help others.

Les VK2AXZ

Charlie Case VK4IQ

Charlie was born in Charters Towers, NQ, in 1916 and at the age of 13 years, moved to Townsville with his family.

He was a motor mechanic for just about all his working life, with a great interest in radio as a result of a short period of employment with Stephenson's Radio from about the age of 15 years until his apprenticeship into the motor trade.

Radio as a hobby continued and, in 1969, he gained his AOCP after attending classes conducted by the Townsville Amateur Radio Club. He was very proud of being part of the amateur radio service, was a tireless experimenter with projects such as VFO stability, CW keyers, antennas and so forth.

After Cyclone Althea devastated Townsville in December 1971, he became a member of the State Emergency Services in the communications section, then became involved with WICEN, particularly with the Sunday morning calls-in on behalf of the Townsville region.

Finally, after years of battling illness, increasing pain and malaise made it necessary to stand down from his WICEN activity.

He was a devoted husband to Esther, his wife who, herself handicapped by disabilities, depended so much on him. Despite his own increasing illness into terminal stages, he looked after all her needs until he could go on no longer and, sadly, he passed away on 7 December 1992, aged 76 years.

To Esther and the family we extend our deepest sympathy. I can only say that knowing Charlie has enriched all our lives in many ways.

Ron Tulloch VK4BF

John Vincent Clifford VK2DDN

Jack VK2DDN, died in Orange on Friday afternoon 22 January 1993. He suffered no pain, only feeling sick, needing to get out of his car and relax. His friend Ray, visiting from Grafton, called an ambulance, but they could not revive Jack, who passed away in peace.

He was born in Strathfield on 5 August 1924 and had a very full and interesting life. At 19 he joined the RAAF and was sent to Canada for training. He flew over 48 missions as a Wireless Operator/Gunner in Lancaster bombers with 464 Squadron attached to the RAF in Britain. Naturally he became proficient in Morse.

Jack lived in many parts of the state during his long service with the Lands and Justice Departments, retiring as Clerk of Petty Sessions at the Orange Courthouse in 1979. He was first licensed as VK2NOF in 1977.

Some of Jack's activities included bushwalking, nature study, local and mining history, camping, bike riding, boating, current affairs, being a very good listener, cross-country skiing, experimenting and talking via amateur radio, radio-controlled flying model aircraft, painting and lots of other interests suited to the bachelor lifestyle And he really was a gentleman.

Jack VK2DDN will not be forgotten by his friends in any group with which he had contact, especially radio amateurs and the Orange club members. His impish grin, his fiendish cackle, his love of cups of tea, interest in and loyalty to the club, his encouragement and help for all are legendary and will be most sadly missed.

His funeral was attended by over 28 from the amateur radio fraternity, who offer sincere condolences to Jack's only surviving relatives, his brother Joe and family.

From Orange and District Amateur Radio Club Newsletter Feb '93

Victor William Bayliss VK2BVW

Bill VK2BVW died at Kiama on 18 January 1993, aged 78. He became well known to virtually every amateur in the region up to the time he moved from Mt Panorama to the coast in 1987. Apart from being Controller of Mitchell Division SES for many years, he was also a generous benefactor to many amateurs starting in the hobby, and a real gentleman.

Bill saw service in the Pacific area in WWII, reaching the rank of Captain in the Australian Army. Farming was generally regarded as his main pursuit for many years, but Bill had very wide interests as well. He was for many years president of both Bathurst Legacy and Bathurst Eisteddfod Society and was active in the Boy Scout Movement.

In 1931 he and his brother Ray instigated motor bike racing at the Vale Circuit, Bathurst. This eventually led to the opening of the now world-famous Mount Panorama Motor Racing track, a most important venue for car racing as well as a vital part of the local economy. His property was halfway down Conrod Straight!

For his services to the community Bill was awarded the British Empire Medal in 1988.

Bill always had time for a chat with any amateur from the area, and kept up regular skeds with Tom VK2NN and others.

Sadly, his widow Collie is extremely ill, and our sincere sympathy goes to son Greg of Bathurst and the other members of Bill's family. He will be missed by all of us, but not forgotten.

From Orange and District Amateur Radio Club Newsletter Feb '93

Geoffrey Richard Hughes VK3AUX

Almost 50 years ago (1945) I first met Geoffrey Richard Hughes who was then a part time dance instructor at the local ballroom dance studio, as well as being a student at the Pharmacy College where he obtained his degree in 1945.

He was also studying for his amateur radio licence and teaching me the finer points of crystal set building. All the parts for this "magically" appeared from his well stocked "junk box". In 1946 he was issued with the callsign VK3AUX and in the same year married his XYL Joan. Geoff was practising his profession at a pharmacy in Toorak Road, South Yarra.

He subsequently took over that business and lived in the dwelling over the shop for most of his working life. It was here, in between professional duties and raising a family of three energetic boys, that he experimented with television using a homebrew camera, pulse generator etc.

Video was put to air on 576 MHz and action shots were obtained by aiming the camera out of the window on to busy Toorak Road.

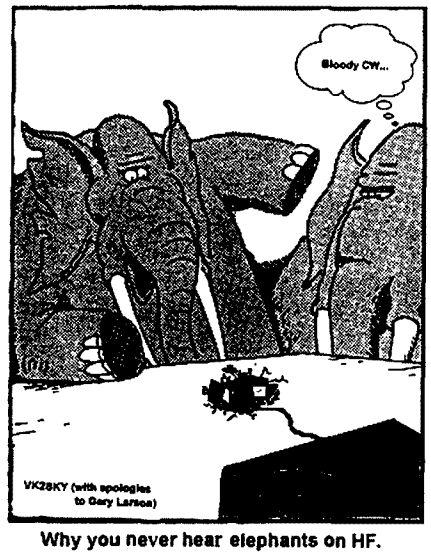
On his retirement from business he took up an interest in geology and went on many field trips.

Amateur radio interests now included experiments on 1296 MHz and 10 GHz. In 1980, he and VK3YFU established a 10 GHz record (60 km).

In recent years besides being an active amateur, he shared his love of classical music (on a voluntary basis) with patients at a hospital for the blind.

So, Au Revoir dear friend and mentor. Your memory shall remain with all of us.

James A Horwood
VK3ZHW
ar



Why you never hear elephants on HF.

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

TVI and Dutch Spolling

The article by Richard Cortis VK2XRC on television interference reminded me of a case from a source other than amateur radio. The interference appears only on Channel 9 and originates from an Eveready Rechargeable Emergency Lamp RE60. It causes two ragged-edge parallel bars to appear on the screen and roll slowly upwards, disappearing at the top then reappearing at the bottom. I understand the company has been contacted by DOTAC, but its response could not be likened to a speeding bullet! At present, removal of the offending device from the AC supply is the only way to clear the problem which, on a "good" night, can make its presence felt for a radius of 200-300m, frustrating quite a few ardent TV viewers.

As an old former Tasmanian I would like to make a correction to the details regarding the "Special Event Station VI7AJT', by Frank VK7ZMF, AR Nov '92 p31.

The name was ABEL JANSZOON TASMAN (not JANSEN) and the ship was the ZEEHAEN. Abel Janszoon Tasman (1603-c1659) was born at Lutjegast, a village in Friesland, northern Holland, and his expedition comprised the two ships "Heemskirk" and "Zeehaen" (with an E). However Zeehan (without an E) became the place name for the Tasmanian west-coast town as we know it today.

Ted Wraight VK3ALT
8 Gregory Court
Pakenham 3810

(I plead guilty, Ted. The original p31 item spelled the name Janszoon, but I changed it to the usual English form which had been submitted for p36 ... VK3ABP, Ed.)

Iambic Keyers

Is there someone reading this who may be able to give me the correct answer? As I am getting aged, bad tempered, forgetful and arthritic and still looking for an easy way to retain my CW skills, I sold my old just worn-out Vibroflex (which I purchased in 1928, but actually did not receive until about the outbreak of WWII) and purchased a Vibroflex Iambic Keyer. I did actually make a small profit on the deal.

Whilst I realize that one can drive the thing anyway one likes, there must be a correct way, and only one way that will produce good readable copy.

Which is the DOT paddle and which is the DASH paddle?

I do not wish to go through the same trauma as I did in 1939 when I used my Bug in Sigs, and thought that my copy was beaut, but got very tired of hearing "ditdit dahdah ditdit pse use other foot"! It took me about a year to forget all the bad habits I had picked up, to learn to use it and to make it turn out consistently good readable copy at commercial speed.

Is there any writing available on Iambic Keying? Hope that you will be able to get me some help.

George Trotter
VK2AVY AX2E23
568 Buchhorn Street
Lavington NSW 2641

Homebrew Hi Tech, Cost not Problem

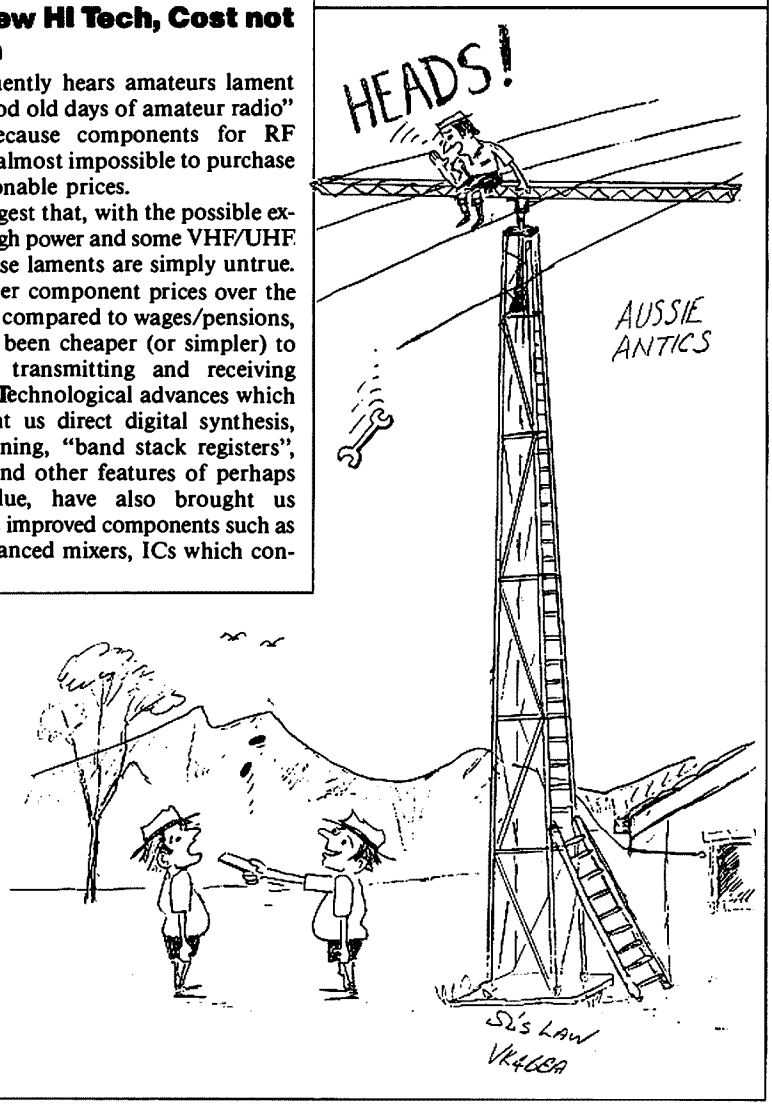
One frequently hears amateurs lament that the "good old days of amateur radio" are over because components for RF projects are almost impossible to purchase new at reasonable prices.

May I suggest that, with the possible exception of high power and some VHF/UHF projects, these laments are simply untrue. If we consider component prices over the last 20 years compared to wages/pensions, never has it been cheaper (or simpler) to build basic transmitting and receiving equipment. Technological advances which have brought us direct digital synthesis, passband tuning, "band stack registers", memories, and other features of perhaps dubious value, have also brought us homebrewers improved components such as low cost balanced mixers, ICs which contain almost a whole receiver on the one chip, and ceramic resonators which permit the experimenter to construct high quality, frequency-agile transmitters without the cost of crystals, and the complications of a VFO (see AR 7/91, p21).

Information and components are widely available from VHF or QRP groups, although it must be admitted that often much of this information is confined to specialist club publications, and is rarely seen in the general amateur radio media.

As one who has experimented with both valve and solid-state communications equipment, I find that while valves may be cheaper if you have all the components at hand, and seem to be better for higher power HF equipment. I do not miss the many hours spent drilling holes and working with a chassis prior to my move to solid state equipment.

Peter Parker VK6BWI
14 Marquis Street
Bentley WA 6102
ar



HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 Ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used for this month's predictions is 74.4. Next month the predicted value is 73.1.

ar

VK EAST: Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.2	8	9.6	8	2	-7	-22	...
2	14.2	6	10.9	6	5	0	-11	-25
3	13.7	0	10.5	1	2	-2	-13	-26
4	16.5	2	12.5	-2	3	1	-4	-14
5	21.8	5	16.8	-7	4	5	3	-2
6	23.7	5	17.5	-9	3	5	4	0
7	24.0	5	17.7	-9	3	6	4	0
8	23.8	6	17.5	-6	5	7	5	0
9	22.3	7	17.4	-2	7	7	4	-2
10	20.3	8	16.1	3	8	7	2	-6
11	18.2	9	14.4	7	9	5	-2	-12
12	16.3	11	12.8	11	9	3	-7	-21
13	15.0	14	11.8	14	9	0	-13	-28
14	14.0	19	11.0	19	9	-2	-19	-38
15	13.2	25	10.4	22	8	-6	-25	...
16	12.7	27	9.9	22	6	-9	-30	...
17	12.1	29	9.4	21	4	-13	-36	...
18	11.5	30	8.9	20	0	-17	...	...
19	11.0	31	8.3	18	-2	-22	...	...
20	11.7	30	8.1	20	1	-16	...	...
21	11.2	29	7.7	17	-2	-21	...	...
22	10.7	21	7.5	12	-5	-23	...	...
23	10.4	15	7.4	8	-7	-24	...	...
24	11.2	9	8.1	7	-3	-17	-37	...

VK EAST:Europe L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.2	2	8.8	4	2	-3	-15	-28
2	12.9	5	8.8	6	3	-4	-17	-32
3	12.8	9	8.8	9	3	-5	-19	-35
4	12.2	12	8.5	11	3	-7	-23	...
5	11.3	16	8.0	12	0	-13	-32	...
6	11.7	24	8.4	17	3	-12	-32	...
7	13.9	24	10.1	23	11	0	-16	-35
8	17.7	21	12.9	28	20	13	1	-11
9	16.6	19	12.7	20	17	11	1	-10
10	15.6	12	11.9	11	11	6	-2	-13
11	15.8	5	12.5	3	5	2	-6	-16
12	14.7	-2	11.6	-3	1	-1	-8	-18
13	13.9	-8	10.9	-7	-1	-3	-9	-19
14	13.3	-13	10.4	-10	-2	-3	-9	-19
15	12.7	-18	9.8	-10	-3	-4	-10	-19
16	12.1	-21	9.3	-10	-3	-4	-10	-20
17	11.5	-30	8.7	-13	-6	-8	-15	-25
18	12.2	-21	9.2	-10	-3	-4	-10	-19
19	14.6	-12	11.5	-13	-3	-3	-7	-14
20	18.6	-2	14.1	-16	-3	0	-2	-7
21	18.6	0	12.6	-13	-1	1	-1	-7
22	16.1	-1	10.9	-7	0	0	-5	-13
23	14.6	-1	9.9	-2	1	-1	-8	-19
24	13.7	0	9.2	1	2	-2	-12	-24

VK EAST: Sth Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.3	24	27.2	33	36	36	33	29
2	32.8	24	27.4	34	37	36	34	30
3	32.8	24	27.1	35	38	37	34	30
4	32.6	25	26.6	37	39	38	35	31
5	31.9	26	25.8	40	41	39	35	31
6	30.4	27	24.4	46	44	41	36	31
7	28.5	30	22.6	51	46	42	36	29
8	26.4	31	21.0	51	46	41	34	26
9	24.2	32	19.1	50	44	38	31	22
10	22.1	34	17.5	50	42	36	27	17
11	20.9	35	16.6	49	41	34	24	13
12	19.9	36	15.7	48	40	32	21	10
13	18.8	36	14.9	47	38	30	18	6
14	17.8	37	13.9	46	36	27	15	1
15	16.9	38	13.2	45	34	25	11	-2
16	15.7	39	12.1	43	31	20	6	-8
17	14.2	40	10.9	40	27	14	-1	-18
18	14.1	40	10.8	40	27	14	-1	-18
19	17.0	35	12.9	40	32	23	11	-2
20	22.4	30	17.2	39	36	32	24	15
21	26.9	27	21.1	37	37	35	30	24
22	29.1	26	23.3	35	37	35	31	27
23	30.1	25	24.4	34	36	35	32	27
24	31.3	25	25.9	33	36	35	32	28

VK EAST: Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.8	13	25.3	10	19	21	19	16
2	30.5	12	24.5	8	18	20	18	15
3	30.9	12	23.7	8	18	20	19	16
4	31.4	13	26.2	9	18	20	20	16
5	32.4	13	26.8	11	20	22	21	18
6	32.7	14	26.6	15	23	24	23	20
7	31.4	15	25.3	21	26	26	23	19
8	29.8	17	25.0	30	31	29	24	19
9	28.3	20	22.5	44	39	34	27	19
10	26.3	21	21.0	44	38	32	24	15
11	24.7	21	19.6	44	37	30	21	11
12	23.9	22	19.0	44	36	29	19	8
13	23.1	22	18.3	43	35	27	17	6
14	22.0	22	17.6	42	33	25	14	2
15	20.5	23	16.1	40	30	21	8	-5
16	19.3	24	15.1	38	27	17	3	-11
17	17.6	24	13.7	35	23	11	-5	-22
18	15.5	26	12.0	30	15	0	-19	...
19	14.8	26	11.4	28	12	-4	-25	...
20	14.0	26	10.8	25	7	-10	-34	...
21	17.7	21	14.0	29	19	9	-5	-22
22	25.8	16	20.0	24	25	23	17	10
23	29.1	14	23.3	18	23	23	20	15
24	29.5	13	24.0	13	20	21	19	15

VK EAST: Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.6	2	10.4	3	2	-3	-15	-29
2	12.8	-5	9.7	-2	0	-5	-16	-30
3	16.4	-1	12.3	-7	0	0	-5	-14
4	23.2	5	17.8	-15	0	4	4	0
5	29.5	7	23.1	-21	-1	5	8	7
6	31.1	7	25.5	-23	-2	5	9	9
7	30.6	7	24.8	-21	-1	6	9	9
8	29.2	8	23.5	-16	1	7	10	8
9	27.5	9	23.1	-8	6	10	11	8
10	25.6	11	20.3	1	11	13	11	7
11	23.4	13	18.6	11	16	15	11	5
12	21.5	16	17.0	18	19	16	10	1
13	20.4	19	16.2	27	23	18	9	0
14	19.5	22	15.4	32	26	18	8	-3
15	18.6	24	14.8	34	25	17	5	-8
16	17.6	26	13.8	34	24	15	2	-12
17	16.7	27	13.0	34	23	12	-2	-17
18	15.5	28	12.0	32	19	8	-8	-26
19	14.1	29	10.8	29	14	1	-17	-38
20	14.1	29	10.8	29	14	1	-17	-38
21	16.9	26	13.3	33	23	12	-1	-17
22	16.1	23	12.4	27	18	9	-4	-19
23	15.1	17	11.6	18	12	4	-9	-24
24	16.3	12	12.6	12	11	5	-5	-17

VK EAST: USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.0	8	23.6	-10	5	9	10	8
2	25.6	9	20.3	-1	9	11	10	6
3	23.0	11	18.3	7	13	13	9	3
4	20.7	14	16.4	15	17	13	7	-2
5	19.5	17	15.4	23	20	14	5	-5
6	18.7	21	14.7	29	22	15	4	-9
7	17.8	24	14.2	32	23	14	1	-13
8	16.9	25	13.3	32	22	12	-2	-18
9	16.2	26	12.6	32	20	9	-5	-22
10	14.8	28	11.4	30	16	3	-14	-33
11	12.9	30	9.9	25	8	-7	-28	...
12	12.7	30	9.7	24	8	-8	-30	...
13	15.7	27	12.4	32	19	7	-8	-26
14	16.6	24	12.9	30	20	11	-2	-18
15	14.4	20	11.1	20	11	1	-14	-31
16	15.8	14	12.2	15	11	4	-7	-21
17	14.2	6	10.9	6	4	-2	-13	-28
18	13.9	0	10.7	0	1	-3	-13	-27
19	16.7	0	12.7	-6	1	0	-5	-14
20	22.0	4	17.0	-13	0	4	3	-1
21	26.3	6	20.7	-19	-1	4	6	4
22	28.3	6	22.1	-21	-2	5	7	6
23	29.1	7	23.7	-21	-1	5	8	7
24	30.0	7	24.1	-17	1	7	9	8

VK SOUTH: Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.0	14	9.5	13	6	-4	-19	-37
2	14.4	11	10.9	11	7	0	-12	-27
3	17.3	11	13.6	9	10	6	-2	-12
4	22.8	9	17.1	5	11	11	7	0
5	24.4	7	18.0	0	8	10	7	2
6	24.9	7	18.2	-3	7	9	7	2
7	25.0	7	18.0	-4	7	9	7	2
8	24.7	7	17.6	-3	7	9	7	2
9	24.0	8	16.9	0	9	10	7	1
10	22.6	9	15.8	4	11	10	5	-1
11	20.7	10	14.4	9	12	9	3	-5
12	18.6	12	12.9	13	12	7	-1	-12
13	16.5	14	11.4	16	11	4	-8	-22
14	14.9	18	10.3	19	10	0	-16	-34
15	13.6	23	9.4	22	8	-6	-25	...
16	12.7	26	8.7	21	4	-11	-34	...
17	12.1	28	8.4	19	1	-16	...	...
18	11.3	29	7.9	17	-3	-23	...	...
19	11.0	30	7.8	16	-6	-26	...	...
20	10.8	30	7.7	15	-7	-28	...	...
21	11.8	29	8.3	19	0	-19	...	...
22	11.4	28	8.0	17	-2	-21	...	...
23	11.0	22	7.9	13	-4	-22	...	...
24	12.0	16	8.7	12	0	-14	-35	...

VK SOUTH: Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.5	10	20.0	6	13	13	10	4
2	25.2	10	20.9	4	12	13	11	5
3	25.6	10	21.6	3	12	13	11	6
4	25.7	10	21.5	3	12	14	11	6
5	25.6	11	21.2	5	14	14	12	6
6	25.4	12	20.8	8	15	16	12	7
7	25.0	13	20.2	13	18	17	13	6
8	23.8	15	19.1	20	22	19	12	4
9	22.2	19	17.6	35	29	22	12	1
10	20.3	21	16.1	36	27	18	6	-7
11	18.3	22	14.5	34	23	12	-3	-19
12	16.5	23	13.1	31	17	3	-14	-35
13	15.5	24	12.2	28	12	-2	-23	...
14	14.6	24	11.6	26	8	-8	-31	...
15	13.9	24	11.0	23	4	-14	-39	...
16	13.4	25	10.5	21	0	-19	...	...
17	12.9	25	10.0	18	-3	-24	...	...
18	12.1	25	9.4	14	-10	-33	...	...
19	11.3	26	8.7	9	-18	...	...	...
20	11.7	25	8.9	12	-13	-38	...	...
21	14.0	22	10.6	22	4	-13	-36	...
22	18.1	13	14.0	18	14	6	-5	-19
23	21.8	12	17.1	13	16	13	6	-2
24	23.8	11	19.0	9	15	14	10	3

VK SOUTH: Europe L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.2	-2	8.4	1	0	-8	-20	-35
2	11.9	2	8.3	4	-1	-10	-24	...
3	11.7	6	8.3	6	-1	-11	-28	...
4	11.2	10	8.0	8	-3	-16	-35	...
5	10.5	14	7.6	8	-6	-22	...	...
6	11.0	23	8.0	13	-4	-22	...	...
7	12.8	22	9.5	19	5	-8	-28	...
8	16.0	21	11.9	24	15	6	-8	-23
9	18.4	18	12.7	24	19	12	2	-10
10	16.1	15	11.3	17	12	5	-6	-19
11	14.0	9	10.2	9	6	-1	-12	-26
12	13.7	2	9.4	3	2	-3	-14	-28
13	12.9	-6	9.0	-2	-1	-5	-15	-28
14	12.3	-12	8.5	-5	-2	-6	-15	-27
15	11.6	-18	8.1	-6	-2	-6	-14	-26
16	11.1	-33	7.9	-15	-10	-13	-22	-35
17	10.8	...	7.7	-22	-16	-20	-30	...
18	11.6	-33	8.5	-17	-10	-12	-20	-31
19	13.7	-15	9.3	-13	-4	-4	-8	-17
20	17.0	-7	12.6	-18	-5	-2	-4	-10
21	17.3	-5	12.1	-16	-4	-2	-4	-10
22	15.0	-7	10.4	-10	-2	-2	-8	-16
23	13.7	-7	9.4	-5	-1	-4	-11	-22
24	12.7	-6	8.7	-2	-1	-6	-16	-29

VK SOUTH: Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.9	7	10.7	8	5	-2	-15	-30
2	12.9	-1	9.8	1	0	-6	-18	-33
3	16.7	1	13.2	-4	2	1	-5	-14
4	24.0	6	18.5	-12	2	6	5	2
5	27.8	6	23.3	-19	0	5	7	6
6	27.7	6	22.9	-21	-2	4	6	5
7	27.6	6	22.6	-21	-2	4	6	5
8	27.2	6	22.0	-18	0	5	7	5
9	26.0	7	20.8	-12	3	7	7	4
10	24.2	8	19.1	-4	7	9	7	3
11	22.1	10	17.4	4	11	10	6	0
12	19.8	12	15.6	12	14	11	3	-6
13	17.6	16	13.9	20	16	9	-2	-15
14	16.3	21	12.8	25	16	6	-7	-23
15	15.2	24	12.0	27	15	3	-13	-32
16	14.4	26	11.4	26	12	-1	-19	...
17	13.9	27	10.9	26	11	-3	-23	...
18	13.4	28	10.4	25	8	-7	-28	...
19	12.7	28	9.8	23	5	-12	-35	...
20	12.1	29	9.2	20	1	-16	...	...
21	12.8	28	9.7	23	5	-11	-33	...
22	15.3	24	11.5	27	15	3	-13	-32
23	16.5	21	12.7	25	18	10	-2	-17
24	17.0	16	13.1	19	15	8	-2	-15

VK SOUTH: Sth Pacific

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.7	17	12.8	19	12	3	-11	-27
2	15.9	17	12.9	19	13	4	-10	-26
3	16.0	17	13.0	20	13	4	-9	-25
4	16.1	18	13.1	21	14	5	-8	-24
5	16.1	19	13.0	22	15	5	-8	-25
6	16.0	21	12.9	24	15	5	-9	-26
7	15.5	23	12.6	26	15	4	-12	-31
8	14.8	27	11.9	29	14	1	-18	-39
9	14.0	28	11.2	27	11	-5	-26	...
10	13.2	29	10.5	24	6	-12	-36	...
11	12.5	29	9.8	22	1	-18	...	...
12	12.0	28	8.8	16	-8	-31	...	...
13	11.3	26	8.0	9	-19	...	...	...
14	10.6	26	7.6	3	-28	...	...	...
15	10.0	27	7.1	-2	-36	...	...	...
16	9.4	27	6.7	-9	...	...	...	...
17	9.1	27	6.6	-12	...	...	...	...
18	9.0	27	6.6	-13	...	...	...	...
19	9.9	27	7.4	-3	-38	...	...	...
20	11.4	23	8.0	8	-18	...	...	...
21	13.1	19	10.3	16	0	-17	...	...
22	14.7	17	11.5	18	7	-5	-24	...
23	15.4	18	12.5	20	11	1	-14	-32
24	15.7	18	12.7	19	12	3	-11	-28

VK SOUTH: USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.6	9	21.4	-10	5	10	11	9
2	27.4	10	21.8	-1	10	13	12	9
3	24.9	12	19.8	8	15	15	12	7
4	22.7	15	18.0	17	19	17	11	4
5	21.5	18	17.0	24	22	18	11	1
6	20.7	20	16.4	30	25	19	10	0
7	19.7	23	15.7	34	27	19	8	-4
8	18.5	24	14.5	34	25	17	4	-9
9	17.5	26	13.6	34	24	14	0	-14
10	15.6	27	12.1	32	19	8	-8	-26
11	13.4	29	10.3	27	11	-3	-23	...
12	13.0	30	9.9	25	9	-6	-27	...
13	14.9	27	11.7	30	16	3	-14	-34
14	14.3	24	11.2	24	12	0	-18	-37
15	13.8	18	10.7	17	8	-3	-20	-39
16	13.0	9	10.0	9	3	-7	-22	...
17	12.3	1	9.4	3	0	-9	-23	...
18	13.0	-3	9.8	-1	0	-6	-17	-32
19	15.6	-2	12.3	-6	0	-1	-8	-18
20	20.0	2	15.3	-12	0	2	0	-5
21	24.1	4	18.8	-19	-1	3	4	1
22	26.7	5	21.2	-21	-2	4	6	4
23	27.7	6	22.5	-21	-1	4	7	5
24	28.4	7	23.6	-17	0	6	8	7

VK WEST: Africa

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.4	20	9.4	16	3	-10	-30	...
2	14.0	15	10.7	15	9	0	-15	-31
3	16.8	13	13.3	13	12	6	-3	-15
4	22.2	12	17.2	10	14	13	8	1
5	25.6	9	19.2	3	12	12	10	4
6	25.7	8	21.5	0	10	11	9	4
7	25.6	7	21.2	-1	9	10	8	3
8	25.5	7	20.9	-1	9	10	8	3
9	25.1	8	20.3	0	9	11	8	3
10	24.0	9	19.2	3	11	11	7	1
11	22.4	10	19.0	9	13	12	6	-1
12	20.5	12	16.2	14	15	11	3	-6
13	18.3	15	14.5	19	15	9	-1	-14
14	16.3	19	12.9	23	15	5	-8	-24
15	15.1	24	11.9	27	14	2	-15	-34
16	14.1	26	11.1	26	11	-2	-22	...
17	13.3	28	10.5	25	8	-7	-28	...
18	12.8	29	10.0	24	6	-10	-33	...
19	12.2	30	9.5	22	3	-14	-38	...
20	11.7	31	9.0	20	0	-18	...	...
21	11.1	31	8.5	18	-3	-23	...	...
22	11.9	30	9.0	21	1	-17	...	...
23	12.6	30	9.7	24	6	-10	-32	...
24	11.8	26	9.1	18	2	-15	-38	...

VK WEST: Asia

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.2	13	22.6	14	20	21	18	13
2	28.7	13	23.4	11	19	20	18	13
3	29.6	13	24.5	9	18	20	18	15
4	29.9	13	23.6	8	18	20	18	15
5	30.4	13	25.3	9	18	20	19	16
6	31.4	14	25.9	11	20	22	21	18
7	31.6	14	25.9	15	22	24	22	19
8	31.0	15	25.2	20	26	26	23	19
9	29.7	17	23.9	28	30	28	24	19
10	28.0	19	23.5	39	35	31	25	18
11	26.3	20	20.9	41	36	30	23	14
12	24.3	20	19.3	41	34	28	19	9
13	22.5	21	17.9	41	32	25	14	2
14	21.6	22	17.1	41	32	23	11	-1
15	20.7	22	16.4	40	30	21	8	-5
16	19.7	22	15.8	39	28	17	4	-11
17	18.6	23	14.6	37	24	13	-2	-18
18	17.6	23	13.8	35	21	9	-7	-26
19	16.2	24	12.6	31	16	2	-17	-39
20	14.5	24	11.2	26	7	-10	-33	...
21	13.8	25	10.7	23	3	-15	...	...
22	17.0	22	13.4	31	18	5	-12	-31
23	22.2	15	17.3	23	22	17	9	0
24	26.5	14	20.9	18	22	21	17	10

VK WEST: Europe L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.7	-13	8.1	-5	-4	-9	-20	-33
2	11.4	-10	8.0	-3	-4	-11	-23	-38
3	11.2	-6	8.0	-1	-5	-13	-27	...
4	10.7	-3	7.7	0	-6	-16	-32	...
5	10.1	-1	7.4	1	-8	-21	...	...
6	10.5	5	7.8	4	-7	-21	...	...
7	12.3	10	9.2	8	-1	-12	-29	...
8	15.2	14	11.3	15	8	0	-13	-28
9	18.2	14	13.6	19	14	8	-1	-13
10	18.7	15	13.7	18	16	11	2	-7
11	14.8	9	11.4	9	6	0	-10	-23
12	13.9	2	10.7	2	2	-3	-13	-25
13	14.7	-2	9.9	-3	0	-4	-12	-23
14	13.6	-9	9.1	-7	-3	-6	-14	-24
15	12.7	-16	8.7	-9	-4	-7	-14	-24
16	12.1	-21	8.2	-11	-5	-7	-14	-24
17	11.5	-34	7.9	-18	-11	-13	-21	-32
18	11.0	...	7.7	-23	-16	-19	-27	...
19	10.6	...	7.5	-27	-21	-24	-33	...
20	11.5	-38	8.2	-20	-13	-15	-23	-34
21	13.5	-18	9.0	-14	-6	-6	-11	-19
22	14.4	-14	10.1	-15	-6	-5	-10	-18
23	13.1	-16	9.2	-11	-5	-6	-13	-22
24	12.2	-15	8.5	-8	-4	-8	-16	-28

VK WEST: Mediterranean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.7	14	9.7	12	1	-11	-29	...
2	11.9	4	9.0	5	-3	-14	-32	...
3	15.2	4	12.0	2	3	-2	-12	-25
4	21.7	6	16.7	-2	6	7	3	-3
5	27.1	7	20.5	-9	5	9	9	6
6	27.4	7	22.9	-12	3	8	8	6
7	27.3	6	22.6	-14	2	7	8	5
8	27.2	7	22.3	-13	3	7	8	5
9	26.8	7	21.7	-10	4	8	8	5
10	25.6	8	20.5	-5	7	9	8	4
11	23.9	10	20.2	3	11	12	8	3
12	22.1	12	17.6	12	15	13	8	0
13	20.1	16	16.0	21	19	14	5	-5
14	18.3	20	14.5	27	20	12	0	-14
15	17.2	22	13.7	30	20	10	-4	-20
16	16.4	24	13.0	30	18	7	-8	-26
17	15.6	25	12.4	30	16	4	-13	-32
18	14.9	26	11.7	29	14	0	-18	-38
19	14.3	27	11.1	27	11	-3	-23	...
20	13.4	27	10.3	24	7	-9	-31	...
21	12.3	28	9.5	20	1	-17	...	...
22	12.6	28	9.6	21	3	-15	-39	...
23	15.1	26	11.9	28	14	1	-17	-37
24	14.5	23	11.2	23	12	0	-17	-36

VK WEST: Sth Pacific

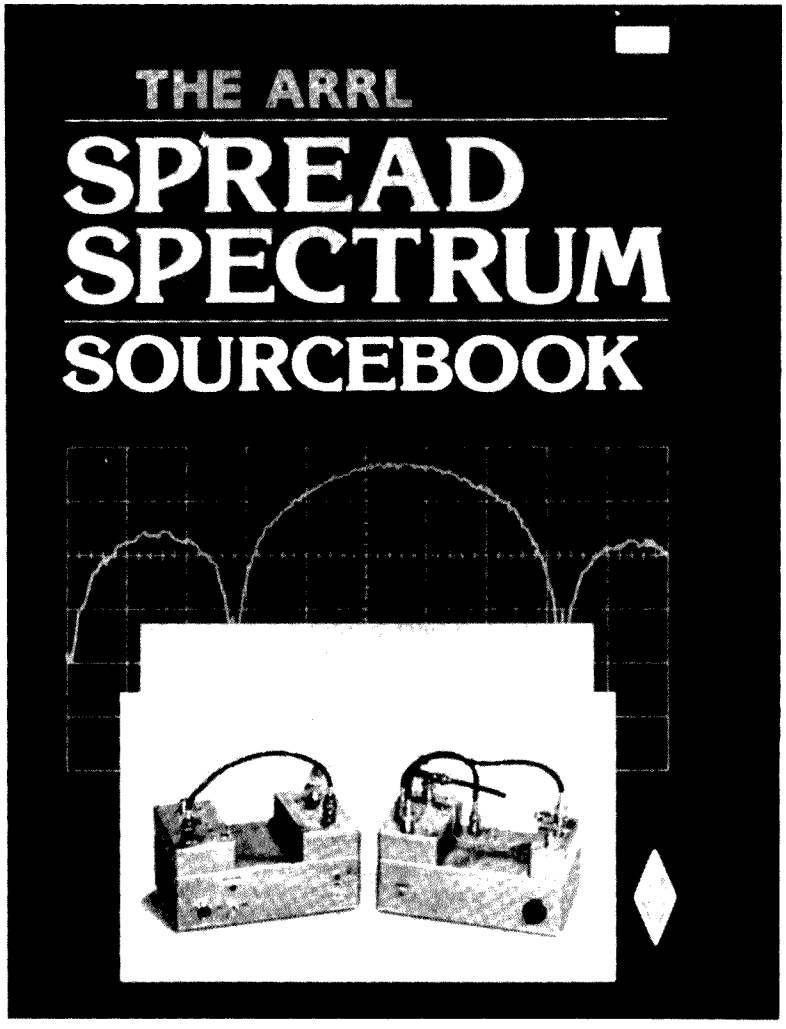
UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.4	16	13.3	17	13	6	-5	-20
2	16.6	15	13.4	16	13	7	-4	-17
3	16.6	15	13.5	16	13	6	-4	-17
4	16.7	15	13.5	16	13	7	-3	-16
5	16.9	16	13.7	17	14	8	-3	-15
6	17.0	17	13.8	18	15	9	-2	-15
7	17.0	18	13.7	21	16	9	-2	-15
8	16.9	21	13.7	24	18	10	-1	-16
9	16.5	23	13.4	28	19	10	-3	-19
10	15.9	26	12.8	31	20	9	-6	-24
11	15.2	27	12.2	30	18	5	-11	-30
12	14.5	28	11.6	29	15	1	-17	-38
13	13.9	28	10.6	27	10	-5	-27	...
14	13.4	26	9.5	23	3	-15	...	...
15	12.6	25	8.7	17	-5	-26	...	...
16	11.8	25	8.3	12	-13	-37	...	...
17	11.2	26	7.8	8	-19	...	...	...
18	10.5	26	7.4	3	-27	...	...	...
19	10.2	26	7.2	0	-32	...	...	...
20	10.0	26	7.2	-1	-34	...	...	...
21	10.9	24	8.0	6	-21	...	...	...
22	12.6	18	8.7	13	-5	-24	...	...
23	14.3	16	11.1	16	5	-7	-25	...
24	16.0	15	12.4	17	10	1	-13	-29

VK WEST: USA/Caribbean

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.4	8	22.3	-20	0	6	8	7
2	25.3	8	20.1	-13	3	8	8	6
3	22.7	9	18.0	-5	7	9	8	3
4	20.3	10	16.0	3	10	10	6	-1
5	18.9	13	15.0	10	13	11	4	-4
6	18.1	16	14.3	17	16	12	3	-7
7	17.2	20	13.7	23	19	12	1	-11
8	16.5	25	12.9	29	21	12	0	-15
9	15.9	27	12.4	31	21	11	-3	-19
10	14.6	29	11.3	30	18	6	-10	-29
11	12.9	32	9.9	27	12	-3	-23	...
12	12.8	32	9.8	27	11	-3	-24	...
13	15.7	30	12.4	34	22	11	-4	-21
14	15.6	27	12.3	30	19	9	-6	-23
15	14.8	22	11.7	23	14	4	-10	-27
16	14.3	16	11.2	16	11	2	-11	-27
17	13.9	9	10.8	9	7	0	-12	-27
18	13.1	1	10.1	3	3	-3	-14	-28
19	12.4	-6	9.5	0	1	-4	-15	-28
20	13.0	-9	9.9	-4	0	-3	-11	-22
21	15.6	-5	12.3	-10	0	0	-4	-12
22	20.2	1	15.5	-18	-2	2	1	-3
23	24.2	4	18.9	-24	-4	2	4	2
24	26.6	6	21.2	-24	-3	3	6	5

The ARRL Spread Spectrum Sourcebook

Edited by A Kasteloot N4ICK and C L Hutchinson K8CH
Published by ARRL
Reviewed by Evan Jarman VK3ANI



The ARRL Spread Spectrum Sourcebook presents for most amateurs a new concept. Spread spectrum is loosely defined as a signal that has more than 10 times the frequency width of the modulating signal. This ratio of frequencies can be in the order of thousands. As the power of the signal is the same, it means that the power density of the signal falls as the signal is spread. This can mean that signal levels fall below the noise floor of normal receivers and are undetectable while still being received on a spread spectrum receiver. Experiments are being undertaken using spread spectrum techniques as a method of conserving spectrum: more signals with less spectrum. It is the only I have heard of where spectrum can be conserved by using wider signals. Spread spectrum signals effectively just raise the noise floor. The spread spectrum concept is also used as a means of obtaining interference free communication. As an example audio signals have been spread modulated across a television signal and both have been received without any detectable interaction. Another common use is in precise ranging radar for both distance from object and the size of the object.

Spread spectrum techniques have been in use commercially and in the military for many years. In one country a VHF spectrum allocation was made available for amateur use, primarily to give the military a source of interference needed for them to test techniques such as spread spectrum.

Seven years ago the FCC gave permission for US amateurs to operate spread spectrum techniques on frequencies above 420 MHz and in an effort to encourage work in this area this book has been published.

The book is written by the ARRL in association with the Amateur Radio Research and Development Corporation (AMRAD) and opens with the perspective of both organisations. It then deals with AMRAD's past efforts in spread spectrum work together with a couple of articles extracted from the pages of QST.

Practical applications and hardware again consists of one section from AMRAD and another from the ARRL. This is the largest section of the book (72 pages). They describe four different systems of spread modulating a signal and give schematic diagrams of some of the systems that have been built. The four systems are frequency hopping, direct sequence (where a rapidly changing binary sequence is used to change the phase of the RF carrier), sweeping carrier and time hopping. Each has advantages and disadvantages in a particular mode so the application generally dictates the system eg sweeping carriers are generally used on radar systems. The diversity of techniques demonstrated could well used as a source of ideas for use in other fields.

The book concludes with two government reports on spread modulation for those who love to theorise as well as a limited bibliography.

There is an enormous amount of information in this book much of which will be new to most radio amateurs. It is solid reading and in total gives a good idea of the amount of work that is required to take an idea and develop it into a viable communications system. Those who are interested in alternative techniques or who thought that there is nothing new under the sun will find in this book a wealth of information and an eye opener. This is not a book for beginners. It does include a lot of mathematics especially in the theory sections and the government reports. The mathematics used are logarithms, summations, sequences and series but stops short of applying calculus. Nothing more complicated than high school.

The Spread Spectrum Sourcebook is a paperback of 384 pages (278mm by 210mm) and is published by The American Radio Relay League.

The review copy came from Stewart Electronic Components.

ar

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE NSW

● YAESU FT101ZD good cond, good performer, new finals, $560; VK2UJ QTHR (068) 65 3213.

● DECEASED ESTATE. Offers in writing (letter or fax) are invited for the following equipment: YAESU FT-301S HF (80-10m) txcvr (#71 120575); fully solid state, 30W SSB & 10W CW, incl mic & power cable for 13.5V supply; YAESU FP-301 13.5V power supply, suits FT301 (above); YAESU FL-110 HF linear amplifier (#7J030422), solid state, 100W, requires 13.5; YAESU FT-7 HF (80-10m) txcvr (#8H080939), solid state, 20W SSB, incl mobile mounting cradle, mic & power cable for 12V supply; ICOM IC22S 2m FM txcvr (#13624), 22 ch PLL synthesiser, 1/10W output, incl mobile mounting cradle & mic; YAESU FT-212RH 2m FM txcvr (#1M790246), fully synthesised, 18 memories, 5/45W output, incl mobile mounting cradle & mic; MICROWAVE MML-144/25 2m linear amplifier & receiver preamp (#7791278), 25W out (3W in), rx preamp 12dB gain, internal RF VOX circuit, 13.5V required; ICOM IC-202E SSB/CW 2m portable txcvr (#02464), VFO 144.0-144.4MHz, incl carry strap & mic; KEN KP-202 2m FM H/T txcvr; 6 channel, 2W output; ICOM IC2A 2m FM H/T txcvr (#12216464), PLL synthesiser 5kHz steps (thumb-wheel), 0.15/1.5W output, AC charger; STANDARD C146A 2m FM H/T txcvr (#W240341), 5 channel, 2W output, incl leather carry case & telephone-type handset; YAESU FL2100B HF linear amplifier (#7G170092), built-in 240V power supply, 1200W max output. Most of the above are in good order (no mods) and are complete with operating manuals, technical handbooks, circuit diagrams etc. Successful purchaser will be responsible for collection and cartage. All offers to buy received by 31 March 1993 will be considered. Contact Bruce Carroll VK2DEQ on (063) 62 8703 or fax on (063) 62 7950, or PO Box 128, Orange 2600.

● PERSON who bought TM401A at Gosford can have forgotten manual. Send SASE (large) with serial number. Swivel chair for shack. $20 ono. Yaesu 207 handheld with accessories, $300 ono. VK2YXM QTHR.

● MOBILE WHIPS, two sets 10-80m $100 per set; 20m helical $50; RTTY equip, Infotech keyboard and modem with cables and manual $400; GFS modem and 2 teleprinter $125 the lot. All good order. VK2BDT Goulburn QTHR (048) 21 5036.

● 1992 AMATEUR CALLBOOKS international and North American listing, both volumes $75 posted. Steve VK2PS QTHR (02) 654 1809.

FOR SALE VIC

● MASPRO NEW YAGI 10-el 144MHz $125; 14-el 430MHz $100; Araki power divider 144MHz $110; 430MHz $100; Kingrotor rotator 100m cables $300; 10DFB cable & N connectors 30m $300; Decibel 144MHz cavity filter $350; Yaesu FT747GX, Ser No 3L020338, EC, MH-1B8 mic, sp/mic, FNB-3 Nicad Pack, YH-2 for hands-free, carry case, technical manual $395; Victor (03) 480 4137.

● ICOM IC-24AT dual band txcvr s/n 01659, battery packs BP83/90, charger BC72, s/n 1455, AC adaptor K565-V, TOKYO ANTENNA coupler HC202. Power SWR meter, s/n 60466, also ANTENNA MOUNTING and CO-AX. Total price $625. VK3DLJ, QTHR (03) 562 1771.

● HF LINEAR amplifiers [illegible] SOLD [illegible] amplifiers, $300 [illegible] VK3FDX (03) 457 7292.

● YAESU FL2100B linear amp EC $550; YAESU FT101E with matching speaker VGC $425; DAIWA CN-510 compact 20 & 200 W Pwr/SWR meter $60; Ron VK3OM QTHR (059) 44 3019.

● 70CM PA MMC 432/50 $200; OSKER BLOCK SWR $40; Ted VK3TG (052) 59 3225.

FOR SALE QLD

● ICOM IC-745 HF transceiver/general coverage receiver with built-in AC power supply, VGC, change in location prompts sale. Maintenance manual included, $750. VK4AGB QTHR (07) 286 5921 or (07) 821 1825.

● LABTECH CRO mod Q0155 20meg dual trace with probes, manual, original box, as new, $550 ono. Switchbox X-3575, Dick Smith, 3XDB25 pin outlets 3XDB25 input. As new. $30. VK4ECS, QTHR ph (071) 25 3415.

● YAESU FRG7700 with tuner, $480; NATIONAL DR49 RX, $220; SCANNERS Realistic Pro-2003 $180; Bearcat 350, best offer; Ron VK4BL, QTHR, (070) 55 0230.

FOR SALE SA

● MARCONI sig gen TF 801B/1, manual, perfect working order, $100; D Campbell VK5WE QTHR.

● MFJ 1276 $420, Yaesu FT767GX 1.8-432Mz txcvr, $2700, Yaesu FT650 HF-6M 100W all mode $1700 Yaesu 227R 2m FM txcvr $160; Kenwood PS-30 20amp power supply $250; ELETE LINE 200W HF amp 80-10m $160. MHW7-10 $40. Gary VK5DX (08) 370 9196.

FOR SALE WA

● KENWOOD TS-440S with ATU, VK88SN SSB narrow filter and VK88C CW narrow filter $1790. EC, perfect working order. Selling to upgrade. S/n 9110304 Bob VK6KI QTHR (099) 64 2246 A/H.

FOR SALE TAS

● YAESU ext VFO FV-101B and speaker, landline unit SP101, both EC, $90 ea. Frank VK7LO, QTHR. Ph (004) 33 3231.

● KENWOOD TS520S, EC, new finals fitted, spare driver inc MC50 desk mic, $550. Shure 404C hand mic $60 VK7AN (003) 27 1171 (also) MFJ active antenna, GC, $85.

WANTED NSW

● MILITARY RADIOS type AR-17, 108, 109, 208, 11, 19, 22, B-40, R1155, T1154, Hallicrafters S-27. Also wanted CIRCUIT DIAGRAMS and/or MANUALS for the above sets and for B-41 rcvr, 62 set, University super tracer — AST, ACE radio wideband oscilloscope, AWA gated amplifier type A55765 and AEI HV power supply type R1103A. Photocopies OK. Phone John Farmer BH/AH (02) 888 9411.

● EARLY MORSE KEYS or assoc gear. MARCONI spark coil or TX equipt from Spark era; Ian VK2WR (02) 634 7210 QTHR.

● ANTENNA ROTATOR for 10m beam; VK2CPK (02) 605 4790.

WANTED VIC

● AWA TYPE S AC power pack as used with AT5/AR8, to complete Victorian science museum existing AT5/AR8. If you can help, please contact Allan Doble VK3AMD QTHR (03) 570 4610.

● FC-107 ATU, grey-blue front, must be in GC. Pay up to $250. Ph (03) 547 0910. Thomas.

● SMALL ROTATOR including control box, suitable 144MHz beam. George VK3GI, QTHR (054) 27 2576.

• KYORITSU VTVM model PV200 circuit diagram, details etc, all costs reimbursed. Ken VK3J11 QTHR (03) 580 5347.

WANTED QLD

• CIRCUIT DIAGRAM to suit "Lunar" 2m linear amp, model 2M10-150P or info regarding same. Tel (071) 22 1368 AH, VK4ZGF QTHR.

• WERNER WULF 10/15 beam older type with single-action locking element boom clamps, broken beam for parts ok. John VK4TL (070) 96 8328.

• MEDIUM DUTY rotator, GC, Keith. VK4MAR QTHR (079) 28 1067.

WANTED SA

• MINI-PRODUCTS ANTENNA HQ1 or C-4, VGC with manual. Bill VK5NWL QTHR (08) 255 6976.

MISCELLANEOUS

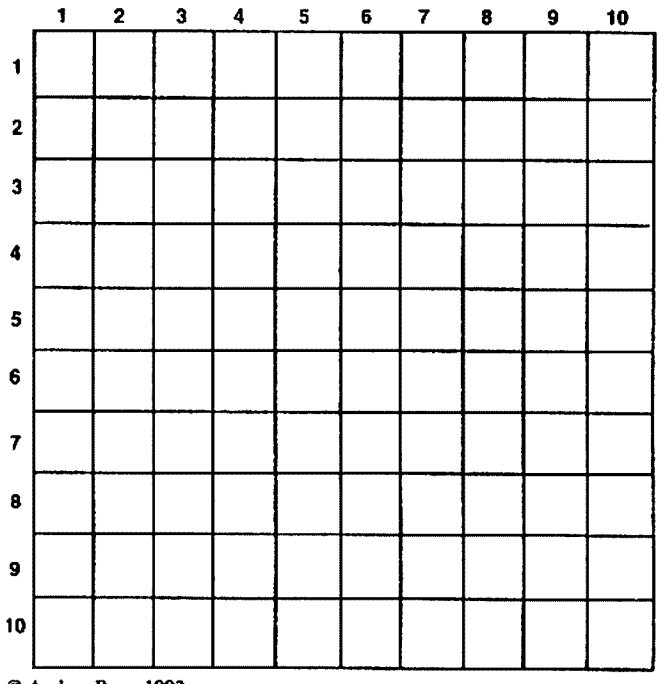
• PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

• 1992 URUNGA RADIO CONVENTION — Easter 10-11 April, Australia's leading foxhunting events. Climate exceptional, 21-24C, trading tables, competitions, quizzes, free tea, coffee, TV. Children welcome. No stairs, lounge, hall, amenities under one roof. VK2ADA VK2DGT VK2DMS

ar

Morseword 72

Solution on page 56



Across

1 Jeans material
2 Position in the army
3 Gippsland City
4 Smoke in anger?
5 Depressed
6 Crimp
7 Footwear
8 Mouths
9 From in Scottish
10 Conceal

Down

1 Chop finely
2 Attack
3 Pelt
4 Sconce
5 Globe
6 Ship's record
7 US state
8 Young Arnold
9 Large feline
10 Mothers

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA currant Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

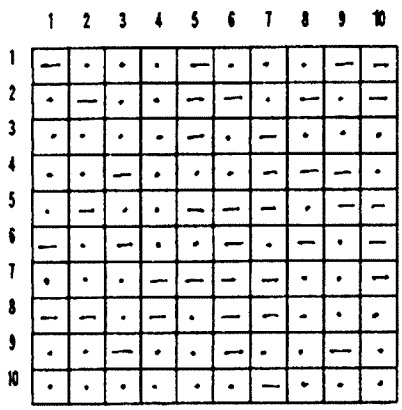
State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

Solution to Morseword No 72

Page 55



Solution to Morseword No 72
Across: 1 Denim, 2 Rank, 3 Sale, 4 Fume, 5 Low, 6 Kink, 7 Sox, 8 Maws, 9 Frae, 10 Hide.
Down: 1 Dice, 2 Raid, 3 Skin, 4 Head, 5 Orb, 6 Log, 7 Iowa, 8 Arnie, 9 Tiger, 10 Mums.

TYPESETTING AND PRINTING: Industrial Printing, 122 Dover Street, Richmond, 3121, Telephone: 428 2958

MAIL DISTRIBUTION: R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070, Tel: (03) 482 2255

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	Price to Members
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX183	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1988	BX259	$104.00
Easy Up Antennas	MFJ36	$39.25
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX182	$16.00
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX026	$49.00
Practical Wire Antennas — RSGB	BX298	$28.00
Reflections — Software 5 Inch disk	BX356	$20.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$8.60
Smith Charts S/Scale 1 SET co ord Imp/Admir Pack of 10	BX901	$8.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$8.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BATC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$69.90
Radio Call Book North America 1993	BX338	$73.90
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley QTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX266	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX267	$48.00
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX198	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1978	BX263	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$56.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$25.80
Radio Frequency Interference — ARRL — 1992 Edition	BX188	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design A Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX365	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$18.00
National Educational Workshop 1981 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX296	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1988	BX262	$78.00
Radio Auroras — RSGB	BX381	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX329A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$16.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$19.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3WA — RSGB	BX393	$38.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing — ARRL	BX368	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX396	$8.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$38.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX348	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX176	$16.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX188	$38.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BX187	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX188	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX265	$16.50
SATELLITES		
Oscar Satellite Review — Ingram — 1986	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX218	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$36.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX448	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX385	$40.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX268	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX436	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$46.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

ICOM

Count on us!

Icom puts "intelligent" transceiver power in your hands

The future is yours today, in the brilliant new Icom range of handheld transceivers, that put real power in your hands.

Newly-developed AI (artificial intelligence) features in the amazing IC-P2AT and IC-P4AT make for easy operation. The "one-touch" AI button remembers previously used functions for simple repeat action, while a built-in test evaluates your knowledge, customising the unit to your ability. With 100 memory channels, optional 5W power, high speed scan and 24 hour system clock, this many features have never appeared before in such a tiny unit.

For dual band FM Transceiving the IC-W2A gives you simultaneous dual band receiving in the smallest unit in its class. 3-way tuning system, 60 memory channels, 2 call channels are just a start. Optional pager and code squelch functions allow selective calling to individuals or groups. Completely independent speaker jacks, volume and squelch controls are some more of the features in this slim unit that fits comfortably in the palm of your hand.

And for the very best in 2M and 70CM handheld transceivers, offering you full 50-905 Mhz wideband receiving, the IC-2SRA and IC-4SRA give you the works. Widen the borders of general coverage receive with VHF and UHF frequencies plus simultaneous dual band receiving. Rugged, splash resistant handhelds, with dual controls, speaker jacks and antenna, these units go beyond the average amateur's needs, with features like 24 hour clock, On/Off timer, advanced scan functions and total recall capability.

Whatever your transceiving needs, ICOM can give you the future, right now.

For further information call free on (008) 338 915 or write to Reply Paid 1009 Icom Australia Pty Ltd P.O. Box 1162 Windsor Victoria 3181 Telephone (03) 529 7582 A.C.N. 006 092 575

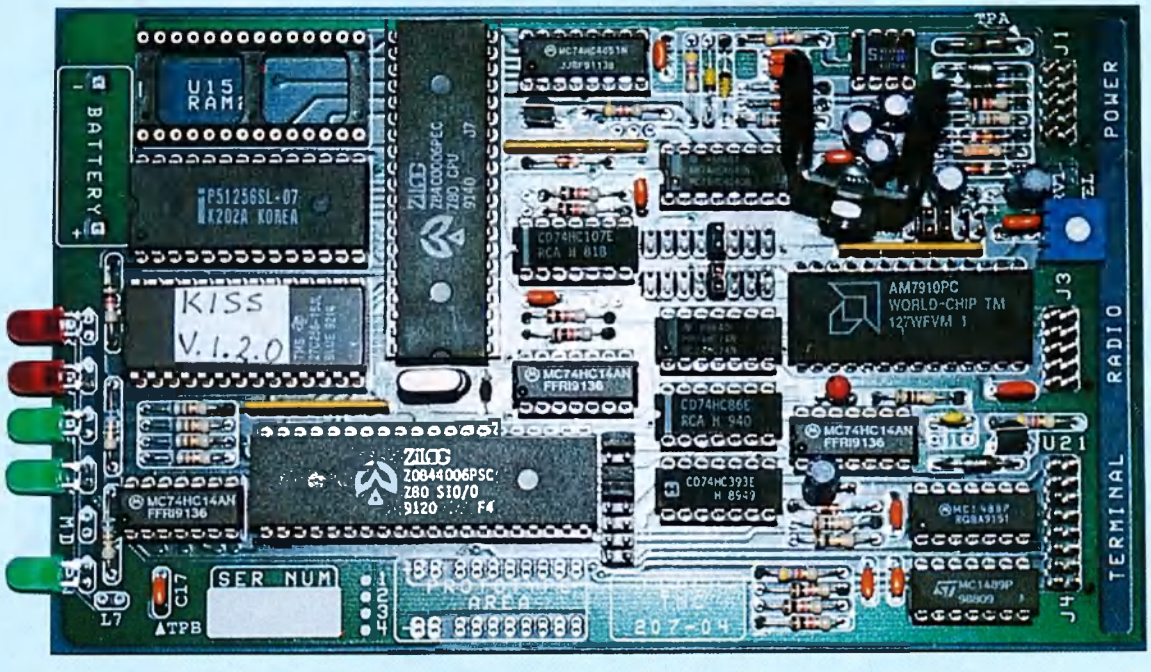
ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.

L L BROWN ADVERTISING 4034

AMATEUR RADIO

APRIL 1993
Volume 61 No 4

Journal of the Wireless Institute of Australia



- Build a simple, metered dummy load
- Equipment Review — PacComm Pactor Controller
- Crossing the Tasman on long wave

YOU'D EXPECT A WORLD LEADER IN COMPACT COMMUNICATIONS TO HAVE AN IMPRESSIVE TRACK RECORD

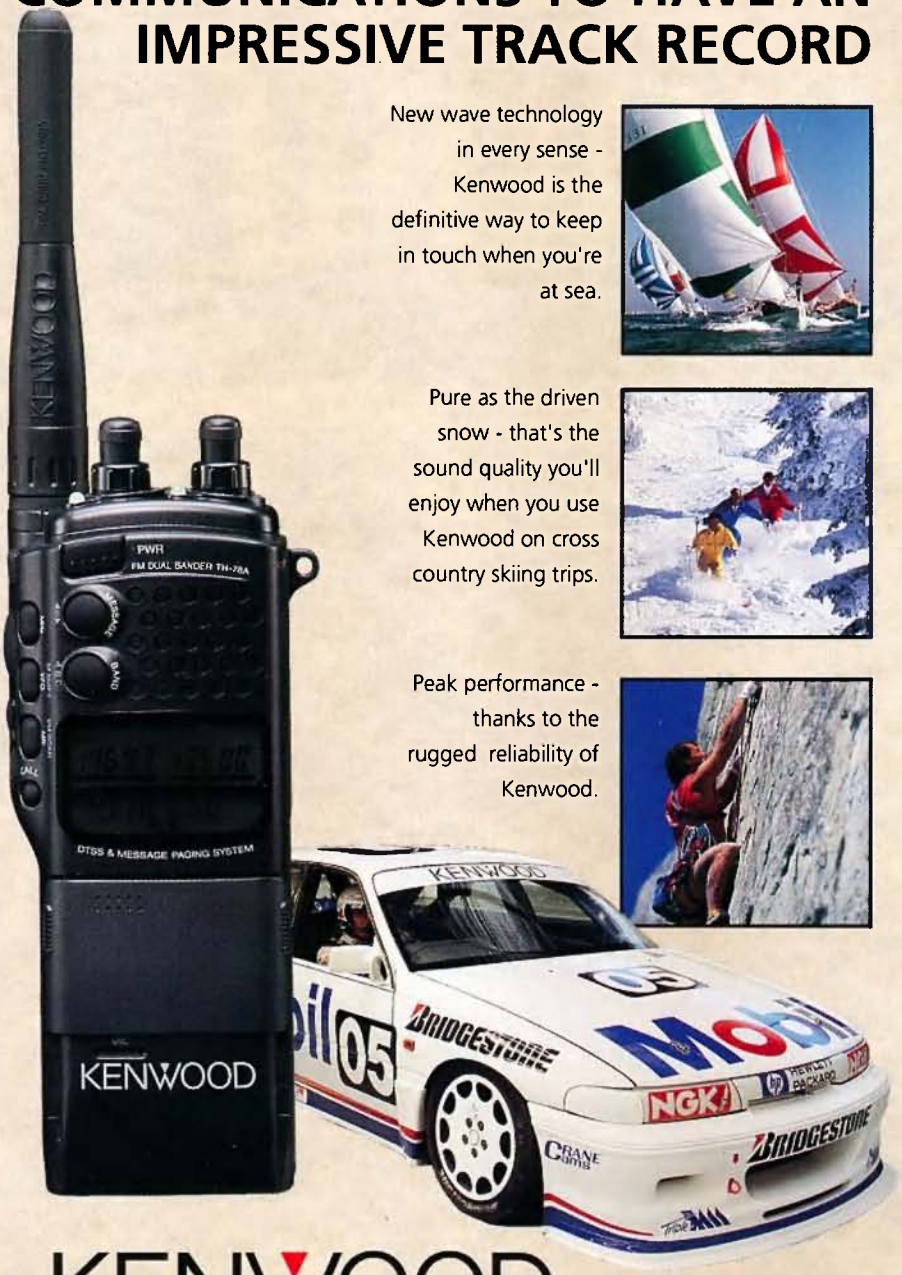
New wave technology in every sense - Kenwood is the definitive way to keep in touch when you're at sea.

Pure as the driven snow - that's the sound quality you'll enjoy when you use Kenwood on cross country skiing trips.

Peak performance - thanks to the rugged reliability of Kenwood.

COMPACT TH-78A DUAL BAND TRANCEIVER

The TH-78A (144MHz/430MHz) sets exciting new standards for portable communication combining simplicity of operation with a multiplicity of sophisticated features. It is an innovative Dual Band Tranceiver ergonomically designed to meet the demands of the Amateur Radio world. Alphanumeric memory, multiple scan modes, DTSS and pager functions, dual-frequency receiver and multi-function memory channels are among the features found in this trendsetter.



Peter Stock

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia. TEL: (02) 746 1519 FAX: (02) 746 1509

N.S.W Argent Communications Blacktown (02) 671 3333, DX Engineering Port Maquarie (065) 849 922, Emona Electronics Sydney (02) 211 0988, F&B Amateur Electronics Ballina (066) 867 204, Lake Maquarie Communications Cardiff (049) 567 255, Macalec Pty Ltd Wollongong (042) 291 455, Reg Stockman Communications Inverell (067) 221 303, Action Communications Kingwood (047) 364 797, **A.C.T** Alex Johnson Aranda (06) 251 4920, **QLD** Emona Electronics Stones Corner (07) 394 2555, Mitchell Radio Co Albion (07) 357 6830, **VIC** Bairnsdale Communications Bairnsdale (051) 524 622, Emona Electronics Melbourne (03) 370 0330, Just Communications Mitcham (03) 873 4142, Measure Tech Supplies Dingly (03) 558 0566, Wecam Wendouree (053) 392 808, Stewart Electronics Components Huntingdale (03) 543 3733, **S.A** International Comms Systems Port Adelaide (08) 473 688, **W.A** Emona Electronics Victoria Park (09) 470 1118, Ford Electronics Osborne Park (09) 242 1766, Leda Electronics St James (09) 361 782, **TAS** Elgin Pty Ltd Launceston (003) 312 711, Elgin Pty Ltd Hobart (002) 344 500.

FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 4 ISSN 0002-6859 April 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Margaret Allen
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
May	12/4/93	14/4/93
June	10/5/93	12/5/93
July	7/6/93	9/6/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

PC Board components of the PAD207 Packet Controller. The controller is available as a kit at a reasonable cost. Details of the controller's operation were described in AR last month (March 1993) by Colin MacKinnon, "Build a Packet TNC" on page 14.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service
Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Ron Henderson	VK1RH
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3ZJC
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
WARC & CCIR:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

FEDERAL QSP

Being a Good Neighbour

What does this expression conjure up for you? For some it's a nature strip of old car bodies with grass protruding from them. For others it's a back yard surrounded by a high fence containing, at least some of the time, savage dogs. But are we radio amateurs pure and blame-free? Are our antennas structurally sound, approved if necessary, and would our insurance pay up if the 20-year-storm takes them into the neighbour's living room? Would our shack wiring pass the Standards Australia code? Are our emissions spectrally pure with only enough power used to make the contact, low pass filters included in HF coaxes and antennas tuned to the operating frequency?

Speaking of linears, AOCP power limits are 400 W pep; however, a recent survey of linears available in Australia showed very few available with that rating. The most common was 1.2kW with some up to 2kW; three to five times the limit. It would be naive to think all of these are meticulously adjusted to 400 W pep. How natural the temptation must be to up the output as the sunspot number falls.

In living with our neighbours we will all be faced at one time or another with the problem of RF interference. Once we have proved our equipment is clear — that is, working within specification — we may feel better. If the neighbour's TV is a cheap import, fitted only with rabbit's ears, DoTC will generally support us. But, what if that TV has passed a stringent type standard as applies, say, for sets of German origin. Both sides are "right", but the interference persists! Now the laws of nuisance apply; the neighbour has as much right to receive clear TV as the amateur has to pursue his hobby. There is only one real solution — negotiation. Any other can be both costly and very anti-social.

The WIA implores radio amateurs to work out their interference problems in a calm and methodical way, because one incident of pig-headedness and the growing aggravation that follows, many times right up to the Minister, can only harm irreparably our enjoyment of our hobby.

Ron Henderson VK1RH, Federal President
ar

PUBLISHERS COMMENT

Comments are continually received about the content and presentation of Amateur Radio magazine. Several changes have been made to this issue in response to this feedback. What do you think?

Bill Roper VK3ARZ
ar

AN RF POWER METER LOAD

(With notes on PEP)

Drew Diamond VK3XU describes the measurement of radio frequency power and other transmission tests.*

The transmitter output should ideally be terminated with a non-radiating dummy load of resistive impedance, usually 50 ohms, into which the power amplifier is designed to work. Here is a simple metered load suited to medium power applications. An optional −40 dB attenuated output and headphone jack are also provided. Parts are available locally.

RF Power Meter Characteristics

Nominal Impedance:	50 ohms +6% −12%.
SWR:	Less than 1.14 from 1.5 to 30 MHz.
Power Capacity:	50 W for 5 minutes, 110 W at 50% duty cycle (determined empirically. More accurate data available from the load resistor supplier).
Attenuation:	−40 dB.

Circuit

Power (in our case electrical power) is defined as "the rate of doing work". Under dummy load conditions, almost all of the electro-magnetic energy conducted to the load is converted into heat energy, so work is done in heating the resistor element, the case housing, the resistor, and the surrounding air. 110 W is a lot of power to have to dissipate in a smallish space, so the load must have adequate capacity, at least in the short term, thereby allowing sufficient time to make the required measurement.

At the 110 W CW power level, the peak voltage is just over 100 V, and half-wave rectification will double this value. The PIV rating of a small signal diode of the 1N4148 variety would therefore be exceeded (ordinary power diodes are too slow for use at

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Terry Ryeland Bob Lloyd Jones Bob Taylor Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Halley Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Ken Ayers David Travis	VK4QA VK4KD VK4ATR
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 344 5241	President Secretary Treasurer	Cliff Bastin Anthony Lumley Bruce Hedland-Thomas	VK6LZ VK6ZTL VK6OO
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			

Note: All times are local. All frequencies MHz.

Weekly News Broadcasts		1993 Fees
3.570 MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70 cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.120, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00

Membership Grades

Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to *Australian resident* (F) (G) (X) grades at fee x 3 times.

RF). A resistive voltage divider samples a fixed portion of the applied voltage. At 110 W, the rms voltage will be about 74 Vac, so 5 Vac will be established across the 330 ohm resistor, being a more appropriate voltage for the diode, and without significantly loading the 50 ohm resistance.

The dc voltage developed across the 0.047 μF capacitor drives the 1 mA meter, which is calibrated in terms of power in 50 ohms.

In order to make oscilloscope, spectrum analysis, or frequency counter measurements, a −40 dB output is made available at a rear mounted connector.

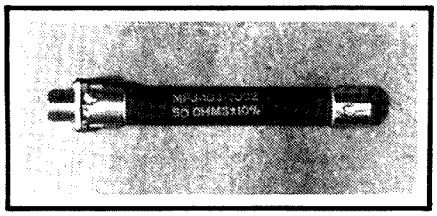
The signal may also be crudely monitored by listening with high impedance headphones at the monitor jack. Clean SSB should sound like "duck talk", without clicks or pops. Keyed CW should be a soft "foomp foomp" sound, again without clicks, pops, noise or whistles (but with perhaps just a trace of hum). AM is detected directly. The meter is disconnected when the "phones" are plugged in.

Construction

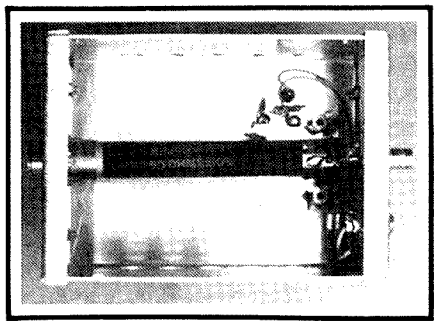
To prevent any signal from being radiated, the load resistor must be housed in a metal case. Above about 50 W the heat generated is considerable. To avoid "melt-down" of the meter, it should be isolated and screened from the load. Shown is a suggested approach. My home-made case measures 115 mmW × 220 mmH × 155 mmD. Holes in the sides and bottom of the load compartment allow convection cooling of the resistor.

The load resistor is a plain metallised ceramic tube type, made by MFJ, part number MFJ-103-9002, and is supplied without connection lugs. Constructors with lathe skills may wish to turn brass tube ferrules to fit snugly over the metallised ends. Good electrical and mechanical contact is obtained by slitting the ferrules one cut lengthwise with a hacksaw. Or ordinary tin-plate (cut from a jam tin) may be formed and soldered to make friction-fitting end connections.

The centre coax pin is connected by a length of stout copper wire



Load resistor with end ferrules.



Load resistor compartment.

insulated with ceramic or glass beads (necessary because the inside of the tube is conductive and also gets rather hot) passed down the centre of the ceramic tube and soldered to the end cap ferrule. That done, temporarily fit the four coax mounting screws with brass nuts. You should find that 3 mm or 1/8" Whit nuts fit nicely around the perimeter. The nuts are then soldered at their correct positions. The four screws can be removed and replaced later when the resistor is installed into the case.

Mechanical support for the live end of the resistor is recommended, and a suggested method is shown, where a rectangle of bakelite has been bored to take the end cap.

The power dissipated by the 2400 ohm resistor is about 2 W at the 110 W level. However, above about 50 W, power must only be applied in short bursts, so we can get away with a more easily obtainable 1 W resistor here.

To reduce the possibility of power being accidentally applied at the wrong end, consider making the attenuated connector a type different from the input, and fixed to the back panel as an extra precaution. If the headphone and attenuator options are not required, simply omit the associated components.

Calibration

There are three empirical methods of calibrating the meter; firstly, by substitution with a known accurate power meter — self explanatory. Secondly, by the use of an appropriate thermocouple RF ammeter, described below. Thirdly, by RF voltage measurement, described in Refs (4) and (5).

For the practical purposes of the following, in a purely resistive load (that is, a real resistor without significant reactive component at the frequency of interest), measured DC resistance and RF impedance may be assumed to be the same value. With a multimeter check the resistance of your completed load. It should read between 44 and 53 ohms, which limits represent an SWR of 1.14 and 1.06 respectively. In practice you should find it to be nearer 50 ohms.

If you do not own an RF ammeter, one of the members of your radio club may have one of perhaps 1.5, 2.0 or 2.5 A sensitivity. For best results, the meter should be housed in a metal

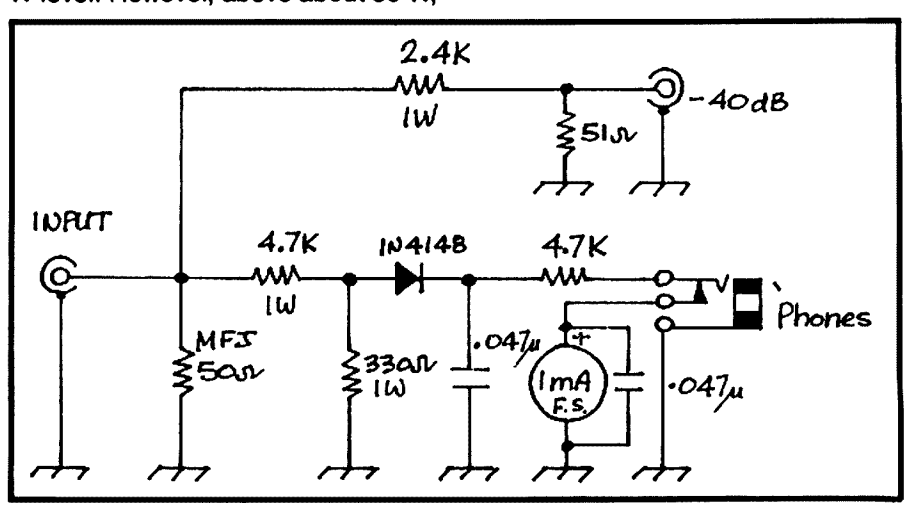
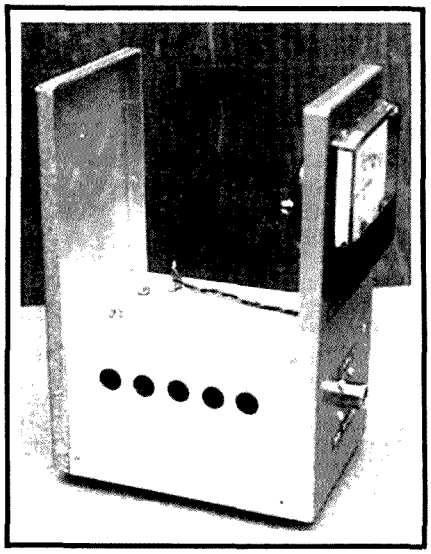
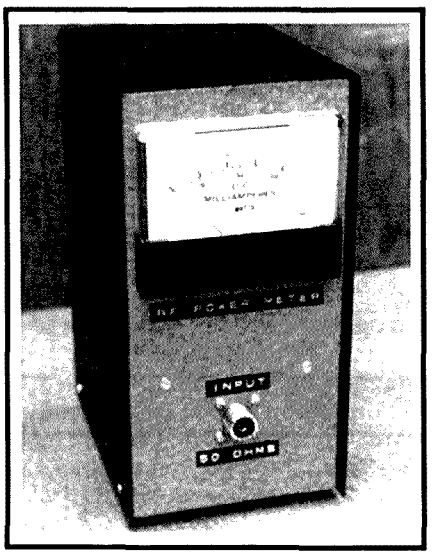


Figure 1 Circuit of RF Power Mater Load



Suggested construction method.



RF Power meter load.

box with coax connectors to suit. Connect the ammeter between your transmitter and power meter, with a short coax (or adaptor) between the ammeter and load. Apply power in the CW mode. For a continuous sine wave;

Mean Power in Watts = I^2R

where I is the current in amps, and R is the pure resistance in ohms. However, we want to know the current required to produce a certain power level, so by transposing;

$$I = \sqrt{(P \div R)}$$

For example, at 100 W the current will be $\sqrt{(100 \div 50)} = \sqrt{2} = 1.41$ A.

Calculate and measure for as many calibration points as required between about 5 W and 110 W. Space exists for a good estimate of the legal 120 W calibration point if desired. Be mindful of any duty cycle limitations on the transmitter's output amplifier. Worked out on a calculator, some values will have more decimal places than can be read on an ordinary meter, so rounding-off to the nearest 0.01 A will generally be necessary. Table 1 may be used as a guide where the load is 50 ohms. The meter reading shown will probably provide adequate accuracy if you cannot calibrate by the above methods.

PEP Notes

The Peak Envelope Power of an SSB signal may be measured by observing a "two-equal-amplitude-tone" waveform on an oscilloscope connected via coax to the attenuated output. The "scope" end of the cable should be terminated in 50 ohms. The linear capacity of the output amplifier shall not be exceeded (ie, there must be no flat-topping or clipping of the

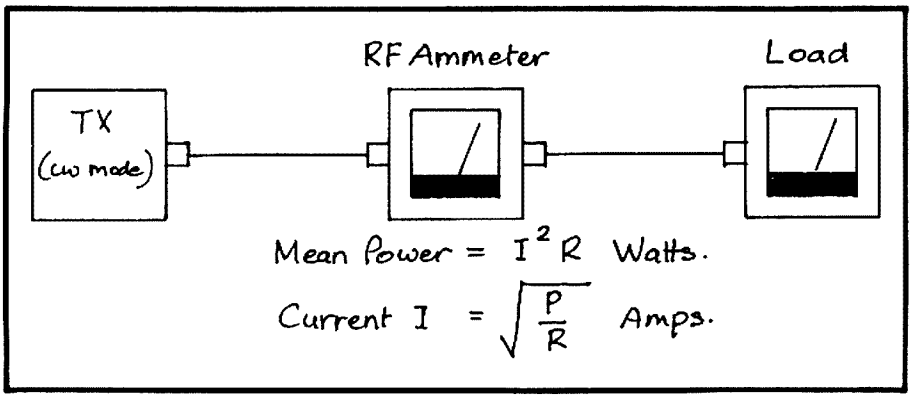


Figure 2 Calibration Set-up for Mean Power.

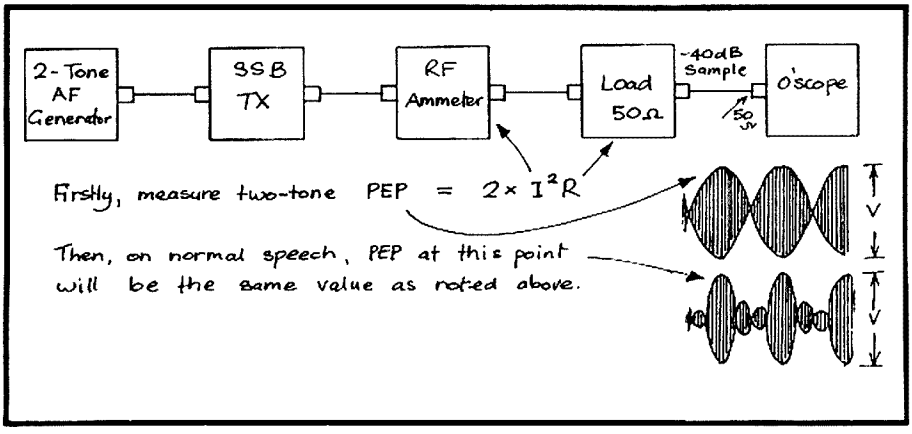


Figure 3 Set-up for measuring PEP.

RF waveform). Read the current I indicated on the RF ammeter.

$$PEP = 2(I^2R)$$

For example, if the current is 1.41 A, then 2(1.41 x 1.41 x 50) = 200 Watts PEP. Now, under actual speech conditions, waveform peaks which attain the measured two-tone amplitude will have a PEP of that value. Naturally, the "scope" must have sufficient bandwidth for the frequency in use. See Ref (1) for a suitable two-tone generator circuit, and Ref (5) for a fuller discussion on RF power measurement.

Parts

The only special component is the 50 ohm non-inductive load resistor. These may be ordered from Stewart Electronics, ph. (03) 543 3733. Cost is about $30. A larger power resistor unit is available if required. The remaining components should also be obtainable from other electronics suppliers.

References

1. Test Equipment for the Radio Amateur- Gibson, G2BUP, RSGB.
2. VHF/UHF Manual- Jessop, RSGB.
3. Radio Handbook- Orr, Sams.
4. An RF Power Meter- Brett, G6EBR, Prac. Wireless August '84.
5. SWR/Power Meter- Hepburn, VK3AFQ, Ham Radio (USA) June '83.

Table 1

	CURRENT	POWER	METER
	0.32A	5W	0.13mA
	0.45A	10W	0.19mA
	0.63A	20W	0.28mA
	0.77A	30W	0.37mA
	0.89A	40W	0.43mA
	1.00A	50W	0.49mA
	1.10A	60W	0.56mA
	1.18A	70W	0.61mA
	1.26A	80W	0.66mA
	1.34A	90W	0.72mA
	1.41A	100W	0.77mA
	1.48A	110W	0.81mA

*"Nar Meian" Garters Road, Wonga Park, 3115.

ar

WIA News

"Golden Antenna" Award

Each year, on the occasion of the German-Dutch Radio Amateur Festival (DNAT), the town of Bad Bentheim (pronounced "bard bent-hime") awards the "Golden Antenna" to radio amateurs nominated for an exceptional humanitarian deed in the field of amateur radio.

The 12th award of the Golden Antenna will take place on 27 August this year. The jury judging nominations comprises the Mayor or Bad Bentheim, the Patron of the Festival, the President of the International Amateur Radio Union (IARU) Region I, and the presidents of the amateur radio societies VERON, VRZA, DARC and VFDB.

Nominations should cover the period between 1 September 1992 and 31 April 1993. Individuals as well as groups may be nominated, who, in emergency situations, rendered their services to other people self-sacrificingly in connection with rescue operations on the occasion of disasters, catastrophes or military conflicts.

The only thing that counts is that "the radio amateur broadcasting has played an important part in the rendering of the humanitarian deed."

Proposals, supported by detailed documents substantiating the nomination, must reach the organisers by 15 May 1993. Send to: **Stadt Bad Bentheim, PO Box 1452, D 4444 Bad Bentheim, Germany.**

The town of Bad Bentheim will invite the award winner to the Festival, defraying the costs for travel and accommodation.

ARRL Stands Pat

The ARRL has abandoned further consideration of a name change, put forward last year. That proposal suggested the League change to the "American Amateur Radio League".

In January the ARRL's Board resolved to continue support for Morse Code proficiency below 30 MHz, as presently required under ITU regulations.

They cited the code's longevity as a license requirement and its ability to overcome language barriers.

Changed Your Address, Callsign?

If you've changed your address and/or callsign, when you notify the WIA Federal Office would you please provide your previous address and/or callsign along with your new details.

While the computer program is good, it can't read minds, nor can Federal Office staff!

Now is a good time to check your listing in the Call Book. Advise any amendments to staff now rather than waiting till the closing date for changes which comes up in a couple of months time.

THE DAY WE CROSSED THE TASMAN ON LONG WAVE

*John Adcock VK3ACA * is one of Australia's few experimenters on Long Wave, and he now describes his latest accomplishment.*

It began with several people obtaining experimental licences to operate on "low frequency" (below the broadcast band). Probably the idea started before then with a number of amateurs in America using an unlicensed (CB) allocation between 150 and 190kHz with very low power. During call-backs after recent test transmissions several people have asked "what is the background for the activity?" Well, the best thing to do is read the several past articles on the subject which fully describe the origins (refs 1, 2, 3 and 5) as well as many articles in overseas amateur magazines.

I first obtained the experimental licence in 1980, but have been very inactive on LF at times, with several years of inactivity. Originally the licences were issued to myself VK3ACA and Peter VK3QI with the callsigns AX3T35 and AX3T36. At that time Peter was in Swan Hill and two-way contacts were carried out between Oak Park and Swan Hill. Later Dennis VK3WV also obtained an experimental licence with the callsign VL3Y in Springvale. Two-way contacts were also made between Oak Park and Springvale. This was in addition to many test transmissions for which reports were received from interested listeners.

The previous regular series of propagation tests was carried out as long ago as 1984. In these tests only CW was used by the author, although some others have tried SSB. During propagation tests the interest of listeners in reporting has been excellent. During these tests the author used a back-yard antenna with probably less than 100 watts to the antenna and a radiated power of about 0.2 watts. The rig is fully described in a previous article, "Experimental Stations on 196kHz" (ref 2). During the operating period using this back-yard rig the signal was heard all over Victoria, Adelaide, Hobart and parts of NSW in daylight, and as far away as Brisbane at night.

I have known Don VK3BDJ for some time and known of his interest in this activity. Several years ago Don constructed a tall vertical antenna at his country property at Gordon near Ballarat, chiefly for 160m operation. Having achieved about as much as possible experimentally from my back yard, it was a case of let the licence lapse or try something more. I asked Don if he would like to set up the station at his Gordon property and he was agreeable.

"What is still our best DX, Perth at night."

The current test series

The first series of tests was carried out on Sunday of the Queen's Birthday weekend on 6 June 1992. The tests were carried out for 15 minutes after each hour from 12 noon to 8pm, 0200 to 1000z with a call-back conducted on 40 or 80 metres after each transmission. The test period was extended to 1100z for listeners in the west. We were late in starting, with several problems, but were going in time for the 0300z transmission.

During this test several loading coils (helixes) were tried, including the original used at the author's QTH (ref 2). The coil was mounted at the base of the mast and, of necessity, in the open. In this case we could obtain only just over 2.3 amps aerial current. To make matters worse, it rained. We had a plastic garbage can in which we intended to place the coil, but unfortunately we had no time to make changes, so we just had to make the best of things.

Despite the difficulties the exercise was reasonably successful. Reports were received from Adelaide, Tasmania and all over Victoria during daylight and, what is still our best DX, Perth at night. VK6ABL received the signal about R3 at 1000z and about R2 at 1100z (8.00 and 9.00pm local time). Unfortunately we did not capture ZL, although ZL3PN thought he heard us. I thought we could do better.

Several changes were made for the next tests. The top loading was increased and a counterpoise was made for the antenna (described below). We used a solid state transmitter, although this may not have increased the power much. We used a new loading coil mounted inside a plastic garbage bin (naturally, according to Murphy's law, it didn't rain). We had better coupling to the coil, but I am still not sure if coupling was optimum.

The tests were carried out on Sunday 13 September 1992 as above, but only from 4pm to 8pm local time, that is 0600 to 1000z. Unfortunately, due to limited time, we could not extend the time to suit the west. The results were more than satisfactory. As usual the signal was heard in South Australia, Tasmania and all over Victoria during daylight.

At 6.15pm ZL3PN in Timaru reported he copied AX3T35 weakly for the 0800z test. For the 0900z test ZL3PN and ZL4MD in Cromwell reported good copy, and for the 1000z test both stations reported QSB, but the signal was copied by ZL2CA. Atmospheric noise was fairly bad, with poor copy on the 80m callback.

At the same time the test signal was copied by Austin VK2DPS at Bingara in northern NSW at 0800 and 0900z; VK4EKA at 0900 and 1000z; VK4GDR at 0900 and 1000z; and VK4ZAA at 1000z.

VK3BDJ antenna at Gordon

Don's antenna is built in typical broadcast antenna style consisting of a triangular steel lattice galvanised mast 109ft or 33m high standing on a base insulator. It is guyed with three sets of guy wires radiating out in three directions at 120 degrees around the mast, with eight levels of guys vertically. A photograph of the basic antenna is shown in fig 1. The guys are broken up into several insulated sections.

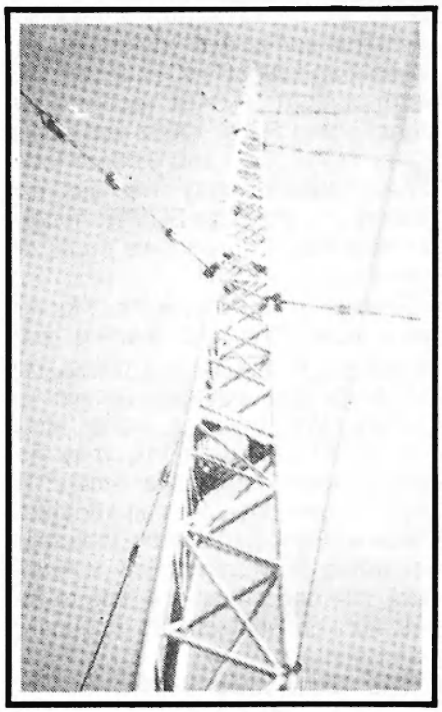


Fig 1. Antenna from below.

To improve the loading and capacitance of the antenna on 196kHz an extra vertical steel pole 16ft or 5m was added to the top, to which a top load of radial wires around 50ft or 15m long was also added. In the final form prior to the last test, 20 top load radials were used.

Also, to improve the loading, a counterpoise was constructed at the base of the antenna which consisted of a hexagon of wire with six radial spokes with each span about 16m long. The counterpoise was suspended from eight poles about 3m high, and insulated with stick porcelain insulators. The construction is shown diagrammatically in Fig 2.

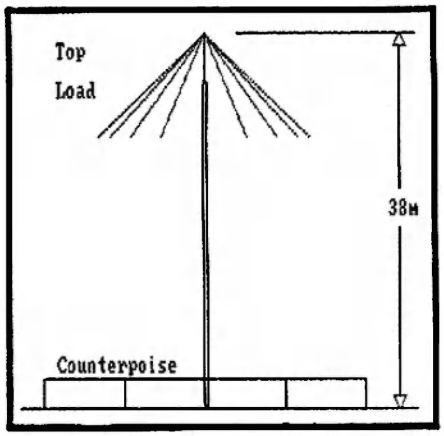


Fig 2. Outline diagram of antenna set up guy wires not shown.

The loading coil used for the September tests was new and wound by Don with flat strip copper with the short edge against the coil former. The former was a piece of 300mm diameter PVC pipe wound with 56 turns. The earth was tapped up 15 turns from the bottom. Fine tuning was achieved with a rotating single turn at the top (variometer). The counterpoise was tapped onto the bottom turn. The coil was coupled to the transmitter with a two-turn link. See Figs 3, 4 and 5.

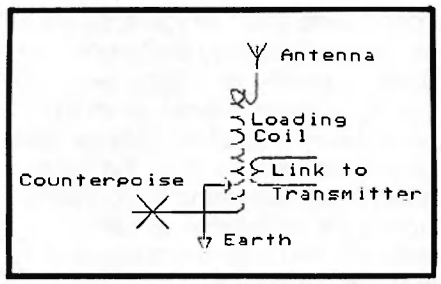


Fig 3. Schematic of antenna loading circuit.

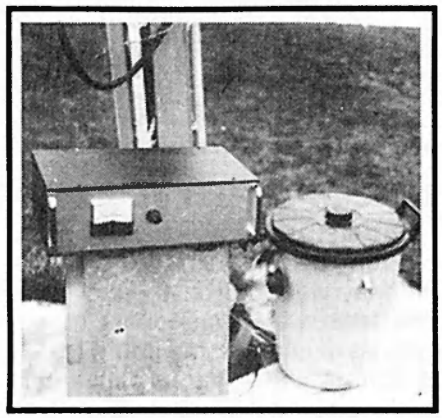


Fig 4. Base of antenna on 13-9-92 showing transmitter and loading coil (bin).

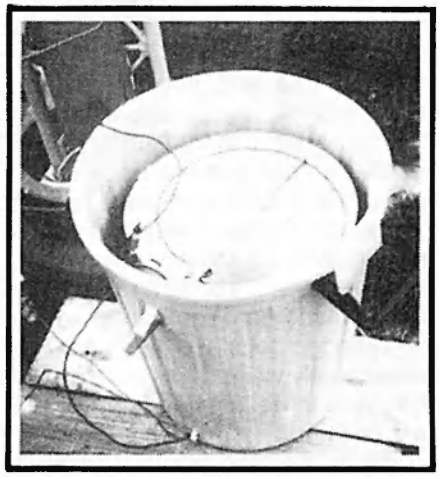


Fig 5. Close up of loading coil in bin.

We achieved about four amps of aerial current with about 90 watts input to the antenna. The counterpoise probably accounted for about 0.4 amps. The loading may not have been fully optimum, but was much better than in June. The big question is what was the radiated power? Methods of estimating this were described previously (Refs 2 and 4). If the antenna had no topload the current distribution would be triangular and the radiation resistance would be 0.24 ohms. If the top load was large and the current distribution was constant top to bottom, the radiation resistance would be 0.98 ohms. The actual radiation resistance lies between these extremes. No accurate measurement of distribution of parameters was made so, using calculation methods from the known geometry of the antenna, the radiation resistance is estimated to be 0.5 ohms. From I^2R radiated power equals eight watts.

The transmitting set-up at Gordon

The transmitter used in June was the original valve transmitter built by VK3ACA (Ref 2). It was crystal controlled with a fundamental on 196kHz. For the September tests we had two transmitters available, but used one made by VK3BDJ using a FET final and an HF crystal with a

Fig 6. Don VK3BDJ in his transmitter case shack.

frequency divider. The latter transmitter appeared to give better results, but the output of both on dummy load was similar. As far as we could measure, the output was between 80 and 100 watts.

Fig 7. Preparing for the days activities.

Don's Gordon shack is in one end of his garage and is enclosed in an ex-3GL transmitter housing. The shack and several other items associated with the day's activities are shown in the accompanying photographs.

Technical Aspects

Calculations have been made based on a method given in a previous article (Ref 6). To give an idea of how the theoretical results compare with those observed, the figures are given in table 1. The calculations are based on a radiated power of 10 watts and field strength in dB above one microvolt/metre at the receiving antenna. A -10dB signal should be copiable in CW with a narrow bandpass receiver. It is assumed the reflection in the double hop case was over sea water. The daytime ionospheric wave case is calculated for a low solar angle case (winter or late afternoon). From this tabulation it is obvious that at this frequency the surface wave gives the best results in the day, and the first hop ground ionospheric wave is best at night.

Table 1

1 Surface distance – km			10	15	20	30	50	70	100	150	200	300	500	700	1000
2 Surface wave poor ground			69.0	65.2	62.5	58.5	53.2	49.3	44.7	36.9	27.4	18.9	5.4	-10.4	-21.5
3 Surface wave good ground			69.3	65.8	63.2	59.6	55.0	51.9	48.6	43.9	40.4	35.9	27.9	22.5	11.9
4 Ionospheric wave – day													-15.1	-4.7	1.8
5 Ionospheric wave - 1 hop night											-12.6	0.0	12.1	15.4	18.2
6 Ionospheric wave - 2 hops night															
1.	1400	1800	2200	2600	3000	3500	4000	4500	5000	5500	6000	6500			
2.															
3.	11.9	-1.4	-13.6												
4.	4.2	2.3	-1.6	-3.5	-10.0										
5.	18.9	16.5	13.2	8.6	4.1	-6.4									
6.	-11.5	-5.2	-2.2	-0.5	0.9	-0.1	-1.9	-4.6	-6.4	-9.6	-13.8	-17.9			

References

1. Australian Amateurs on Long Wave. Jim Linton VK3PC. AR Jan 1984.
2. Experimental Stations on 196 kHz. John Adcock VK3ACA AR July 1984.
3. Long wave in Australia. Dennis Sillett VK3WV ARA July 1987.
4. Home Station Antennas for 160 metres. John Adcock AR May to August 1971.
5. VK Amateurs on 196 kHz. Donald Bainbridge ARA 29th Sept. 1992.
6. Propagation of Long Radio Waves. John Adcock VK3ACA AR June 1991.

* *12 Albert St, Oak Park 3046*

ar

WIA News

Ron Wilkinson Award Winner

Recipient of the prestigious Ron Wilkinson Award for 1992 is Gordon MacDonald VK2ZAB, a resident of Berowra Heights, a northern suburb of Sydney.

Given for "special achievement in any facet of amateur radio", the Award honours the memory and achievements of the late Ron Wilkinson VK3AKC.

Gordon MacDonald VK2ZAB has been a long-time pioneer in terrestrial weak-signal, long distance VHF and UHF communications techniques, particularly in recent years in what is now referred to as "aircraft enhancement" propagation.

For some 10 years, he has kept regular schedules on VHF and UHF bands with other stations in Canberra, Melbourne, Brisbane and other distant points, seeking to experiment with and exploit the signal enhancement afforded by high flying passenger aircraft passing through roughly the mid-point of the path between two stations.

In that time he has developed the mode from an experimental, almost "hit-or-miss", exercise into a routine method of working interstate as far as Melbourne and Brisbane, from Sydney, on both 144 MHz and 432 MHz.

Until the early 1980s, when Gordon started work in earnest on the mode, these paths were considered "impossible" to bridge on these bands using terrestrial propagation.

At the Sydney end, Gordon has truly acted as an anchor for the fraternity of amateurs attempting to experiment with and exploit aircraft enhancement propagation on 144 MHz and 432 MHz. He has often worked alone from the Sydney end, with little encouragement or interest from other operators, yet, unlike many pioneers, Gordon has publicised his work, advancing a detailed hypothesis on the propagation mode, one of the first people in the communications or scientific world to do so. And he chose the WIA's journal Amateur Radio to publish it.

Gordon's strategic efforts as a "Sydney anchor" over the past decade have contributed much to scientific knowledge on this propagation mode, clearly outweighing work contributed by amateurs in the USA and Europe, and sparking off others to write and publish technical papers on the propagation expressing differing technical points of view.

Gordon has done much to publicise and popularise the mode through writing articles in AR magazine, presenting lectures at seminars, club meetings and field days and always freely giving advice and sharing his knowledge in true amateur spirit.

Gordon has also served on the Council of the NSW Division, in the mid-1980s.

Probably the best testimonial to his efforts is the large number of stations now active on weekend mornings on 144 MHz and 432 MHz throughout South Eastern Australia. The mode is more regularly exploited in Australia than anywhere else in the world.

EQUIPMENT REVIEW
THE PacComm PacTOR Controller

Frustrated with Packet Radio? Is there a life after RTTY? Bruce Kendall VK3WL reviews PacComm's PacTOR Controller which may be just what you've been waiting for.

A few months ago I received a telephone call from the WIA General Manager to inform me that a package had arrived for me containing a PacTOR Controller. Could I come by the Federal Office and collect it for review ? Thus started a challenging and often frustrating period of review and evaluation of the latest piece of HF data communications equipment from PacComm, of Tampa, Florida, USA.

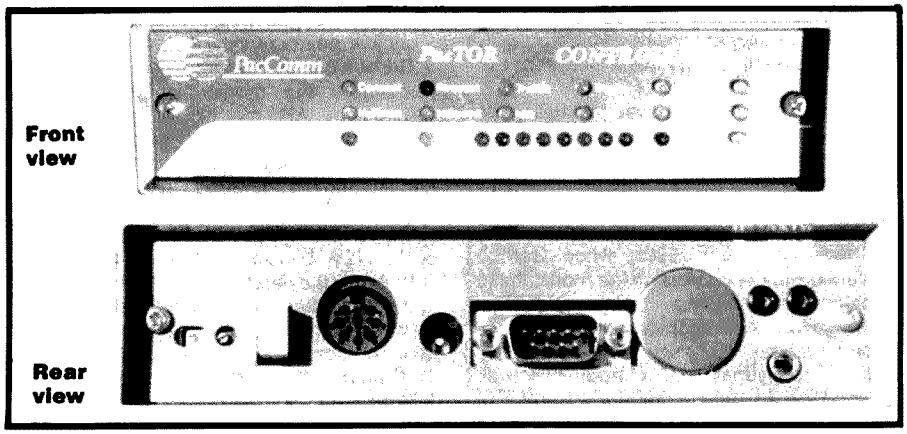
What Is PacTOR?

The full details and theory of PacTOR are well beyond the scope of this review to explain. For the uninitiated I would refer you to articles published in AR Dec 92 by DJ0OW, and March 1993 by 9M2CR, also the Oct 91 issue of QEX by DL6MAA and KF4KV. Briefly however, PacTOR is a mode of digital communication combining the power and integrity of packet radio with the durability of AMTOR, necessary on a high frequency communications circuit. Those of you who have had any exposure to RTTY, AMTOR, or Packet Radio on HF will be aware of the pitfalls of these modes when subjected to the noise, fading, static crashes, and other extraneous phenomena that are commonplace on these frequencies. PacTOR virtually eliminates all of these problems whilst maintaining a respectable data throughput.

Product Description

The PacTOR Controller (PTC) came well packed ready for shipping and included a full serial cable, manual, circuit diagram, and connector suitable for making a radio interface cable to connect to a HF transceiver, and a 5.25" DSDD floppy disc containing the communications program "Procom". The first thing that strikes you about the unit is its solid appearance. Mounted in a well made cast aluminium case with clearly labelled front and rear panels, soft rubber feet are supplied to be attached to the underside to protect your operating desk. No 12 Volt DC power pack is supplied. I thought this was a pity. An Arlec mains adaptor was used during the review.

The front panel has 23 LEDs (refer photograph) which indicate status, mode, and tuning which is critical with data communications of this sort. The back panel contains output tone and level adjustments which are conveniently externally accessible, a power switch, HF radio port, a polarity labelled 12 VDC power input, DE-9 male connector, tuning scope output terminals, 3.5 mm paddle type Morse code key socket, and provision for a VHF/UHF Packet Radio outlet which is available as an option but was not fitted to the test unit.



However, this consists of a separate printed circuit card and new front panel. The front panel PacTOR/ Packet selector switch is already in place and only requires the fitting of the new panel and a push button switch cap. This would be an excellent addition for those requiring both HF and VHF/UHF digital communications without the need for constant changing of connections to radios and computers.

The PTC requires 11-14 VDC @ 400 mA although 300 mA is quoted as being the typical current drain. The micro processor used is the ubiquitous Z80 running at a clock speed of 6.144 MHz which is crystal locked by its own internal clock frequency generator, whilst a lithium battery maintains user set parameters and the real time clock during periods of power down. Firmware version 1.32 was installed in the test unit.

Both FSK and AFSK outputs are selectable by internal jumpers although FSK is the preferred mode, and in conjunction with a 500 Hz filter is a very effective transmit and receive combination. It was found that even during times of severe QRM, QRN, and QSB throughput was not noticeably affected with the above selection.

This review was done using a Kenwood TS940S transceiver and an ATN 13-30 8 element Log Periodic Array and an 80 m dipole. Both FSK and AFSK modes were utilised. It was found in AFSK mode (ie audio in the phone patch input and the radio selected to LSB) that best results were obtained with the SSB Slope Tuning set to 100% Low Cut, ie the lower half of the SSB signal completely cut off.

Installation

After unpacking, one is tempted to connect the computer, PTC, and transceiver together, after making up a radio interface cable. But it's not so simple! The first thing that strikes you when you unpack the device and read the manual, is the manual itself. Typical of most things to do with digital communication the writers of these instruction books appear to have difficulty coming down to an elementary level, understandable to

a relatively uninitiated person.

The manual for the review PTC left much to be desired. It lacked basic operating examples and clear parameter descriptions or how to use them, instead concentrating on the theory of operation and the history of PacTOR. In its favour the manual does come with circuit diagrams, a parts list, and a component overlay showing where everything on the PCB is positioned. It is significant to note that everyone I communicated with during the course of this review said they had the same problems with their PTCs, and this appears to be true regardless of brand.

The manual contains 56 pages in all and could easily be twice that size if written properly. I must admit to a personal prejudice in this area but firmly believe that many a fine piece of equipment in this field has been marred by manuals written for experts rather than newcomers to the mode.

The serial interface can be configured to baud rates of 9600, 4800, 1200, and 300, and again internal jumpers are utilised for this. The transmit PTT can be switched by either grounding via a FET, internal relay, or floating relay contacts. AFSK or FSK is also selectable in a similar manner. An intriguing option exists whereby the PTC can be controlled by a paddle type Morse key in AMTOR and RTTY modes! Morse characters are converted into corresponding ASCII characters and control characters such as ESC, Backspace, CR, and Control-Y have an assigned Morse code equivalent.

Why anyone would want to use this method of operation is a little difficult to understand. However, suppose you have a computer or terminal with a broken keyboard, a PTC, and you're good at using your paddle Morse key. You could still communicate via AMTOR or RTTY. (I can see you all champing at the bit to try this one out!) And this option too is jumper configurable.

The PacTOR Controller is configured as Data Communications Equipment, the same as an RS232C modem, whilst the computer or terminal is Data Terminal Equipment. Details of how to configure the serial cable using various combinations of DB- 25 and DE-9 connectors, and how to ensure that terminals get their required CTS, DCD, and DTR signals is detailed. Likewise, radio interfacing with the usual AFSK/FSK, ground, PTT, Rx audio, and optional power input or floating PTT relay connections, is also specified.

"The serial interface can be configured to baud rates of 9600, 4800, 1200 and 300."

Once the hardware configuration was done the terminal software was loaded into a Data General #One IBM compatible lap top PC. The software supplied as mentioned above is Procom. At first this proved to be a little user un-friendly but after a little time, and the realisation that it should be booted up from the PROCOM.BAT file which includes a few operator hints, all was well. I did try to use the excellent Packet Radio terminal program Paket V, but this suffers from the fact that the program interprets such characters as Control-Y, and the PTC requires a pure Control-Y character to change transmission direction in PacTOR mode. This I found to be a pity as Paket V is a better radio communications program than most and if the author Tony, VK2DHU, can come up with a suitable version that is PTC compatible he will be on a winner.

The above completed, the operating parameter defaults can be checked or altered if required. I found that the defaults were satisfactory for the purposes of the review, communicating over short (VK) and long (HB) distances.

Operation

Again I was frustrated by the manual. Getting into receive mode was difficult due to ambiguous instructions. However, after a little help, I managed to find the commands to "listen" to PacTOR, AMTOR, and RTTY signals. These are;L 1, AM, and BAU, respectively. After listening around for a while it was time to try and make a connect. In PacTOR mode the command; C VK3WL will invoke an ARQ connect. A long path option can be initiated by; C! VK3WL. This is typically used over paths of > 40,000km, has a tx delay of 25 ms and a cycle time of 1.4 seconds. In longpath mode throughput is decreased to about 90%. However this feature was not required during the review. Depending on band conditions the PTC will adjust its baud rate to either 200 which is standard, or 100. And again depending on conditions Huffman data compression is automatically enabled or disabled. Control-Y is the Tx/Rx change over character. Another interesting feature is the auto CW ident. This parameter sends a 40 wpm identification every seven minutes.

To end a QSO simply send a Disconnect and the QRT procedure is performed. In the case of an emergency a DD command will terminate proceedings. Alternatively a Control D will suffice. An on-line HElp file is available which gives a brief description of the PTC commands. REMote control and access is possible by another station and a Personal Mail Box is available with a capacity of 21006 bytes.

Memory ARQ is a facility whereby incorrectly received packets are stored and overlaid to make up a complete and correct packet. This is achieved by applying the incoming signal to an A/D converter and doing a CRC checksum. If the check sums at the transmit and receive ends are equal, the next packet of information is sent. However, if the checksums do not equate the PTC stores the incorrect packet as an 8 bit value and overlays any incorrect packets subsequently received. If for example 3 incorrect packets are received and digitally overlaid one upon the other a correct packet can be constructed and a correct CRC response will then allow the next packet of data to be sent. In this way multiple re-tries are avoided as happens with Packet Radio. On the PTC a memory ARQ reconstruct is annunciated by the error LED on the front panel glowing green. If the LED is red a packet or control contains errors.

My first contact on PacTOR was with VK2ALS. Adrian was most patient in going through a series of checks and experiments to enable me to become familiar with this new mode. I subsequently checked into

the JA5TX BBS on 14.071/2/4/6/8 MHz and found that I got best results by tuning to 14.07608 MHz.

DK0MHZ also runs a BBS on 14.0715 MHz and for the 80 m enthusiasts DF0THW runs a PMB on 3.5926 MHz. Colin, 9M2CR can be found on 14.078 between 0800-1600z. PacTOR activity seems to be centred around 14.079 and 21.079MHz whilst in Europe direct QSO's are reportedly common on 3.5838MHz. The AMTOR calling frequency is 14.075MHz. VK2AGE runs an AMTOR system on 14.075/7 and 21.076MHz, which might be worth having a look at. Certainly the JA5TX BBS is well patronized and is easy to get into from Australia most of the time.

Further PacTOR, AMTOR, and RTTY contacts were made with such stations as; ZL3MA, 9M2CR, JK1DNW, VK4SSB, VK4AZV, JA3NLT, VK2SG, and several European stations. And I would like to record my thanks to them for persevering with my requests for information and their willingness to participate in experiments during this review.

Conclusions

After getting over my initial frustration with the manual, I found the PacComm PTC to be quite user friendly. Certainly PacTOR is going to be the dominant digital mode on HF in the future, as technology stands today. One thought that did come to mind was the possible application of a PTC for international forwarding on the Packet Radio network instead of the current practice of using Packet on HF. The throughput would certainly be improved.

One would do well to consider the PacComm PTC in conjunction with the available VHF/UHF Packet card to make up a compact and modern digital station able to communicate on both modes.

PacTOR is still a relatively new communications technique and would suit someone looking for new horizons to explore or the Amateur seeking very reliable long distance digital communications.

The review appliance was supplied by Blamac Computer Services of 26b, Bombala Street, Cooma. 2630. Tel:064-52-3112. Fax:064-52-4317, to whom all enquiries should be directed.

ar

AR single coil Z match

Lloyd Butler VK5BR describes how to build it and how it works.*

The idea of a single coil Z match tuner was brought to our attention by T J Seed ZL3QQ in the March 1982 issue of Break-In. He demonstrated how a tuned single coil could be connected to produce parallel resonance at two different frequencies and be tuned over two different tuning ranges without coil or capacitor switching.

ZL3QQ showed how the circuit could be designed so that the two ranges were complemented to produce continuous tuning over the complete range of 3.4 to 30 MHz. By using this arrangement as the shunt element of a Z match tuner, the single coil assembly replaced the two coil assembly of the conventional Z match.

The ZL3QQ Z match system was discussed by Random Radiators in the August 1992 issue of Amateur Radio. However, if you are interested in the mathematics of the subject, you should get hold of a copy of the Break-In article.

A further report on the Single Coil Z match appeared in "Random Radiators", which was published in the February 1993 issue of Amateur Radio magazine.

In that article, Ron VK3AFW and Ron VK3OM made reference to the assembly, in Melbourne, of several experimental single coil Z match units and these have been sent over to me for a technical assessment. Where necessary, I have suggested minor changes which I found were needed to match a wide range of load conditions over the desired spectrum of 3.5 to 28 MHz. I also tried out some coils of my own. All in all, I have recorded quite a lot of data on different coil arrangements which worked quite well but, rather than confuse the issue, I will only report on the performance of one particular design which showed up best.

The unit discussed in "Random Radiators" is based on this design, except that they have changed the method of forming the coil, and at the time of going to print the fixing of the coupling coil was still under review. As I have discussed in previous articles, the wide load impedance range of the Z match unit is dependent on the coupling coefficient being somewhat less than one and a change in the assembly of the coupling system might alter the performance to that reported here.

Before proceeding further, please refer to the design of figure 1 which is described as being in use at ZL3QQ. The secondary winding of

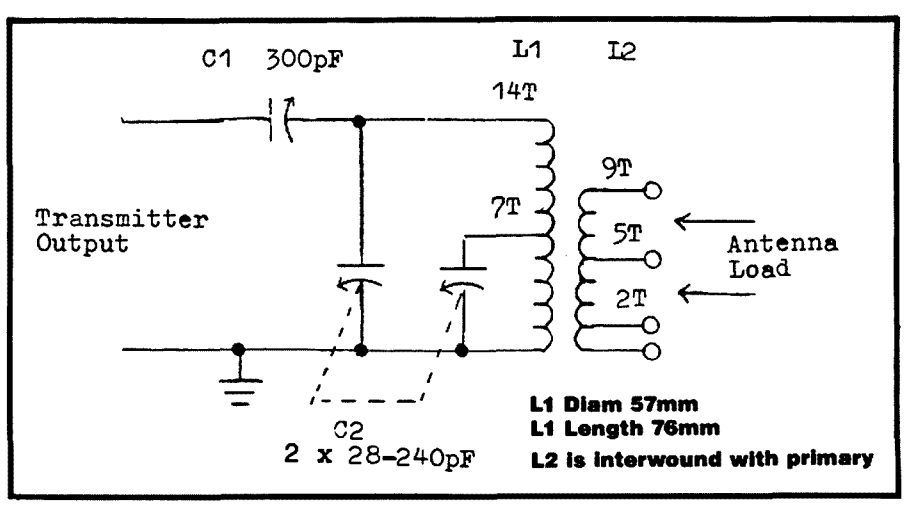


Figure 1 ZL3QQ Single Coil Z Match Tunar

the coil has 9 turns interwound with the primary and tapped at 2 and 5 turns. To provide an impedance load range, two, three, five, seven, or nine turns can be connected to the load. In our Z match units, secondary switching is not required and a wide load impedance range is achieved using a fixed secondary coil much like the fixed secondaries of the two coil conventional Z match unit.

What has been achieved is a very simple but versatile unit — one coil assembly, two tuning controls, but no switches. Despite its simplicity, the unit can match a complete load resistance range of 10 to 2000 ohms for all bands between 3.5 and 28 MHz inclusive.

This will be demonstrated further in the curves which have been included. Because our circuit is a little different from that submitted by ZL3QQ and in our view a refinement, we had to give it a name. Because it results from the work of a number of amateurs who support AR, we have called it the "AR Single Coil Z Match".

Whilst the main purpose of this article is to report on the performance of a simple single coil Z match unit to operate in the 3.5 to 28 MHz region, I will follow on to show how the operation can be extended down to 1.8 MHz by the addition of a switch and a few fixed capacitors. This might be of interest to those who would like to experiment with the Z match on that band.

The Preferred Unit

The circuit diagram of the Z match unit to be described is shown by figure 2. The primary coil has 14 turns of 16SWG tinned copper wire at a diameter of 57mm and wound over a length of 84mm with a tap in the centre at 7 turns. Up to this point the coil design is very similar to the ZL3QQ primary coil. However, unlike the ZL3QQ unit, our secondary (spaced around the primary) has 4 fixed turns of 16 SWG tinned wire at a diameter of 67mm and wound over a length of 24mm.

The first turn of the secondary is lined up between with the first and second turn at the "earthy" end of the primary coil. The assembly is held in place by a 3mm thick perspex sheet drilled as shown in figure 3 to locate the spiralled wires and made to the same construction method as described previously for the two coil Z match. (Refer Random Radiators, Amateur Radio, March 1990). The construction method has the advantage of rigidly controlling the coil inductance and the coupling coefficient which are the two main factors in defining the characteristics of the unit.

By following the construction procedure, one can be confident that the results given here are repeatable. Apparently a number of radio amateurs have been discouraged from building a Z match tuner because they have not felt confident in making this type of coil assembly. This is the reason why Random Radiators has discussed the alternative use of a PVC former which they hope will make construction easier.

"A very simple but versatile unit — one coil assembly, two tuning controls, but no switches."

Comparing our figure 2 circuit with that the ZL3QQ circuit in figure 1 you will notice that we have tapped the input capacitor down the coil to the 10 turn point. With the input capacitor at the top and the fixed secondary, we were not able to get the impedance range on the higher frequency bands. Tapping down the coil magically corrected the problem and gave us a wide load impedance range at all frequencies. The tap at 10 turns has been carefully selected. The further it is tapped down, the larger the input capacitor needed to match low impedances at 3.5 MHz. At 10 turns we need no greater than 350 pF.

As you proceed further and examine my curves, you will see that we can carry out all the matching with an input capacitor of 350 pF maximum value and a split stator capacitor of 250 pF maximum value. Of course, you can use larger than these values but make sure you also have low minimum capacities. To match some load resistances on some of the bands, we need capacitance as low as 20 pF.

Operation

How does it all work?

For those who are not up to delving into the ZL3QQ mathematics, I will try to give a simple explanation. A Z match circuit is in reality an "L" network of series capacity and shunt inductance which in its basic form can transform a given load resistance to a lower value at the network input. The series capacitor in the circuit is self evident but the shunt inductance is formed by tuning the parallel tuned circuit to the inductive side of resonance.

If we ignore the coupling coil and connect the output straight across the tuned circuit we can imagine the whole network to be one complete tuned circuit at resonance with the source signal fed in series with the circuit at low impedance and the output connected in parallel with the circuit at high impedance. If we understand tuned circuit theory we can deduce that the impedance transformation ratio is almost equal to QI squared where QI is the loaded value of Q. Of course, the impedance transformation is further modified by the turns ratio between the coupling coil and the primary coil and by the extent of their mutual coupling.

In the conventional Z match tuner, the shunt circuit is made up of two coils of different inductance, each with its own output coupling coil. As a basic idea, the larger coil is provided for the lower frequency range and the smaller for the higher frequency range. A switch is provided to select between the two coupled outputs. In actual fact, the circuit operation is really more complicated than this as the two coil circuits, in conjunction with the tuning capacitors, are interactive with each other. In using the Z match unit we have found that a large coil for low frequencies and a small coil for high frequencies does not always apply and usual procedure has been to try both outputs for the match whatever the frequency.

ZL3QQ has depicted the complete two coil arrangement as one circuit which has two resonant frequencies and with variable tuning, two separate

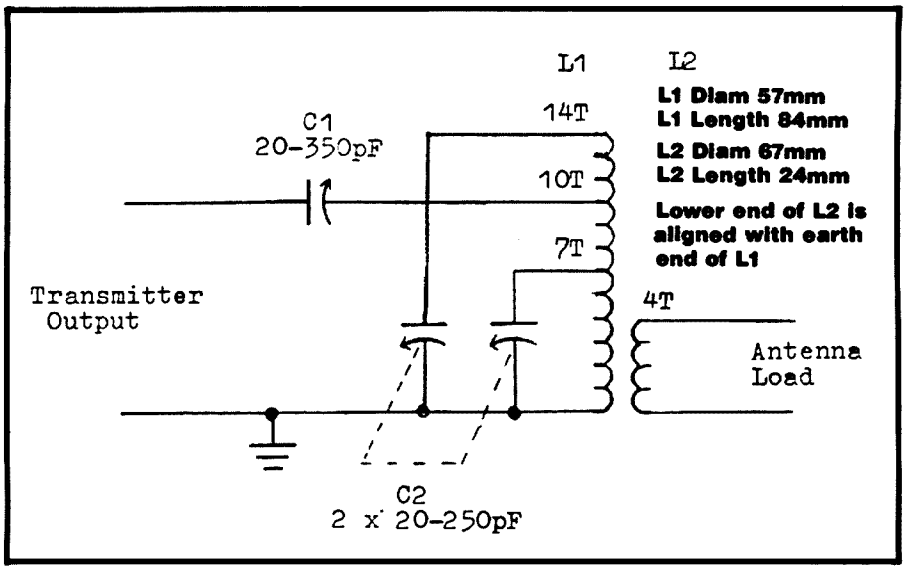


Figure 2. AR Single Coil Z Match Tuner

tuning ranges. He substitutes this with a single coil assembly tapped at the centre, or some other point part way down the coil, as shown in figures 1 and 2. Again the circuit has two resonant frequencies and with variable tuning, two separate tuning ranges. The lower frequency tuning is influenced by the inductance of the full coil and the higher frequency tuning by the inductance reflected at the tap. By appropriate design of the coil unit in conjunction with selected tuning capacitance, the top end of the low frequency range is made to just overlap the bottom end of the high frequency range and provide a continuous coverage over 3.5 to 30 MHz. Of course to make up the shunt arm of the "L" match network, the parallel circuit tuning capacitor is set to a value less than that for resonance so that the circuit actually looks like an inductance.

One thing which has an important bearing on how well the Z match works is the output coupling circuit. If we coupled the parallel circuit straight across the load or coupled through a 1:1 ratio transformer, the "L" match circuit would be unable to reflect a resistance to the input any lower than the load resistance itself. That is for 50 ohms input, the lowest load resistance would be 50 ohms. To match lower load resistances, we have to make them look much higher to the matching network. This is achieved partly by the step down turns ratio and partly by keeping the coupling coefficient somewhat less than one.

The low coefficient introduces leakage inductance but it also introduces a higher reflected resistance component. For very low load resistance values, the reflected resistance actually increases as the load resistance is lowered. This is one reason why we can match such a wide load resistance range in the Z match unit and hence why I previously emphasised rigid control of the degree of coupling in making the coil assembly.

I guess some explanation should be included concerning our input tap in figure 2. In testing various forms of the single coil assembly, we usually found that there was a need to trim the total number of turns, or the position of the split stator tap, to make the unit work over the wide load resistance and frequency range. In the case of the figure 2 design, tapping down the input capacitor was the modification needed to make the unit work so well over the whole testing range. The improvement was found by experiment and exactly how it has changed circuit parameters has not been fully examined.

It is interesting to observe some of the effects of two resonant conditions in the single coil assembly. In one arrangement tested, we had a fairly large split stator capacitor (around 440 pF). With this model, it was possible to match 14 MHz near both maximum and minimum capacity ends of the split stator capacitor. This was all done with the same setting of input capacitor.

In the second and final part of this article, which will be published next month, Lloyd discusses the performance shown by his experiments on the AR Single Coil Z Match, PLUS a modification to enable its use on 160 metres.

* *18 Ottawa Avenue Panorama SA 5041*

ar

WIA News

NEW WIA MEMBERS

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of February 1993.

L20915	MR C FLANAGAN
L20916	MR G TANOS
L20917	MR R TOOBY
L20918	MR T F VANDERMEEL
L20920	MR K RATKOVIC
L20922	MR P BHAT
L31525	MR R KELLY
L40341	MR L UNG
VK1KCS	MR C F SCOTT
VK2BVH	MR B H HALPIN
VK2CLC	MR C L CRONIN
VK2FUU	MR F A WRIGHT
VK2GVI	MR G G RAJOYOGAM
VK2GWA	MR D PHILLIPS
VK2GXB	MR K M HAWKINS
VK2KDG	MR D J GARDINER
VK2MMH	MR G RAJOYOGAM
VK2NQ	MR J BRAND
VK2NSS	MR N S STEELE
VK2TBG	MR A JOHNSTON
VK2VVV	MR K J DRAPER
VK2XOI	MR V N STAFFORD
VK2YDJ	MR D J JONES
VK2YKI	MR G M HAMMOND
VK3END	MS M HAMILTON
VK3FBC	MR B CURTIS
VK3NAC	MR C HONE
VK3NDI	MR D I MAYES
VK3PAJ	MR P JOY
VK3ZSR	MR B RILEY
VK4COZ	MR P N HOLTHAM
VK4NAC	MR N A FAULKNER
VK5AKQ	MR J L SCHAUMLOFFEL
VK5JAA	MR D G GILES
VK5KBW	MR B WARNER
VK5KCW	MR M UCHIDA
VK5NSD	MR D STEFANAC
VK5ZLM	MR T L C HARDING
VK5ZWI	MR G R WILLIS
VK6BIE	MR W P MCNAMARA
VK6YCG	MR A B PATTERSON
VK7BFF	MR B F FRITSCHE
VK7NT	MR M G TOWNSEND
VK7ZRF	MR R F GRANT
VK8ZZ	MR G HEMING

TECHNICAL ABSTRACTS

Gil Sones VK3AUI

SKYLOC

SKYLOC is a HF Locator Beacon system developed in Australia. A range of spot frequencies is used in a sequence of transmissions to ensure that suitable propagation is encountered. The system operates in the 3 to 16 MHz range and uses a 10 Watt Tx and an integral loop antenna or an external antenna if available.

The receiver system uses an array of seven antennas to receive the beacon signal. The received signals are analysed to determine both the direction and vertical angle of arrival of the signal. Using either predicted or measured data on the height of the reflecting ionospheric layer the location of the beacon can be calculated.

Use of an HF system offers extended range with little time delay in the detection and location of a beacon. Other VHF and satellite systems whilst effective suffer with respect to their range and the possible time taken to acquire a signal. Both critical factors for the success of a search and rescue operation.

The system is an Australian development. An outline of the system appeared in The Journal of Electrical and Electronics Engineering Australia September 1992 published by the IE Aust and IREE Aust. The authors were Messrs Goodwin, Jeffrey, and Hichens.

Australian work on HF propagation and Ionospheric research and HF direction finding has been carried out over a number of years. This application is one use of such research work. The Jindalee project is another significant use of HF Techniques.

Handheld Roundup

A rather interesting comparison of handheld transceivers was published in QST Oct 1992 by J W (Rus) Healy NJ2L. Ten handhelds were purchased and given a lab test as well as being field tested over a 12 week period by a panel of users.

Some of the handhelds are not as widely available in Australia but the technical test results make interesting reading. The units tested were not units submitted for test by manufacturers. The review team obtained a second test sample of one of the rigs when an under performance was suspected. Only a big organisation like the ARRL and QST can afford such testing.

The figures obtained for some radios that are locally available are shown in Table 1. Remember that these were obtained from a small sample of radios bought over the counter in the USA. They did however conform to specifications where given.

The level of Tx spurious emissions was within the USA standard in all cases.

The sensitivity and IMD performance figures are of interest in assessing the performance of the radio. This is especially so where disturbance from adjacent services may occur. The use of an external antenna instead of the supplied whip may also worsen the potential for disturbance.

The Tx power is given for the standard battery pack. Many handhelds will give 5 watts if a 13.8 volt supply is used. However at 5 watts output users should very seriously consider the likely field strength in the vicinity of the antenna. It may well be approaching a level which may give cause for concern. Many other factors are involved but the potential is there.

The turnaround time given is the time for the receiver audio to recover after transmission. This has some relevance to operation with packet. Also of relevance to packet use is the time from pressing the PTT to the transmission of a distortion free signal. The PLL does take some time to settle down. These times are involved in the selection of the timing of the packet system. With laptop computers and micro TNCs many handhelds see service on packet.

Metal Boom Helical Antenna

A metal boom helical antenna is described in QEX Jan 1993 by Ron Lile K0RL. This design does away with the use of a wooden or other insulating boom in a helical antenna.

The only non-metallic structural items are the helical element support stand-offs. This should result in a far more durable structure. The element support standoffs used were dowel but some sort of plastic support may be possible. One possibility would be the plastic riser tubes used in garden watering systems. Alternatively you may even resort to chopsticks as Colin Richards 9M2CR did in his article AR Jan 1980.

The maximum boom diameter mentioned in QEX was 2.5 inches or 62.5 mm for a 432 MHz helical. The design published however used a square section tube of 13/16th inch or 21 mm. The size is not particularly critical and 20 mm or 25 mm would be useable.

The boom and reflector screen frame are shown in Figure 1.

Table 1

Radio	ICP2AT	TH28A	FT411E	FT415
Sensitivity dbM 12 dB SINAD	-124	-125	-121.5	-123.5
Two Tone 3rd Order IMD Dynamic Range 20 kHz Offset	65dB	64dB	43.5dB	64.5dB
Adjacent Channel Rejection 20 kHz Offset	70dB	63dB	63dB	68.5dB
TX Power Watts with Std Battery	0.49/ 1.5/2.3	0.015/ 0.66/2.16	0.77/2.38	0.67/ 1.74/2.2
Tx Rx Turnaround Time				
Mute On m/s	120	54	95	160
Mute Of m/s	120	54	70	120

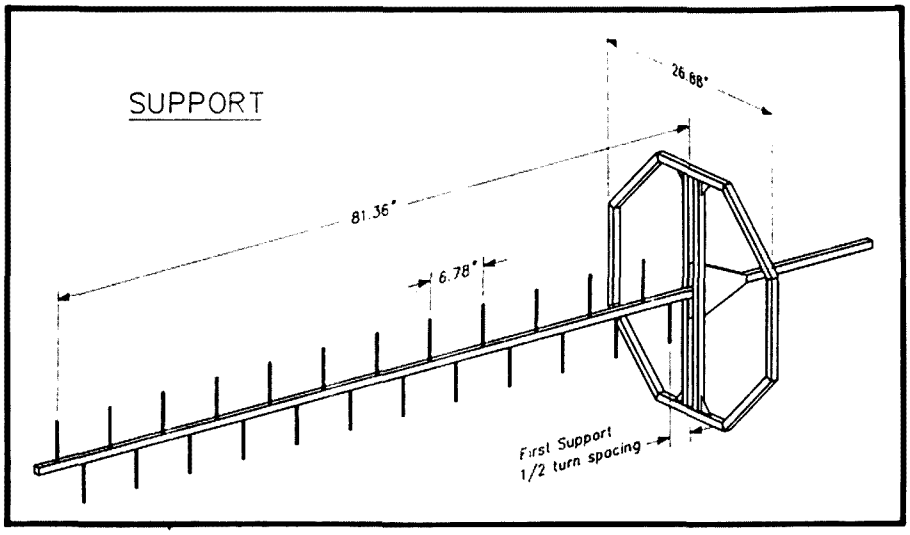


Figure 1 — Metal Supporting Structure for the Helical Antenna.

The radiator was made of flat aluminium wire and the reflector from aluminium mesh.

Some variation here to suit local products is possible.

The antenna dimensions are given below:-

Centre Frequency	435 MHz
Wavelength	687.3 mm
Diameter of reflector	687.3 mm
Diameter of Radiator	0.006 to 0.05 wavelength
	4.13 mm to 34.4 mm
Pitch Angle	12.5 degrees
Radiator Circumference for Max Gain	1.13
Radiator Diameter	247.3 mm
Pitch or Turn Spacing	172.1 mm
Boom Length (12 Turns)	2065.9 mm

A point of interest is the mention of the use of a quarter wave cup to obtain maximum gain. This would appear to be a quarter wave edging around the reflector screen. Its action would appear to be analogous to the use of multiple reflectors with yagis or the skirt seen on many dishes.

Radial Line Stub

Quarter wave and half wave stubs are frequently used at VHF and UHF where they provide a convenient means of decoupling bias and supply circuits. An improved version was described by Geoff Krauss WA2GFP in the Jan 1993 edition of QEX.

The familiar use of a half wave track for decoupling is shown in Figure 2.

The quarter wave stub of low impedance , the wide one, transforms a high impedance into a low

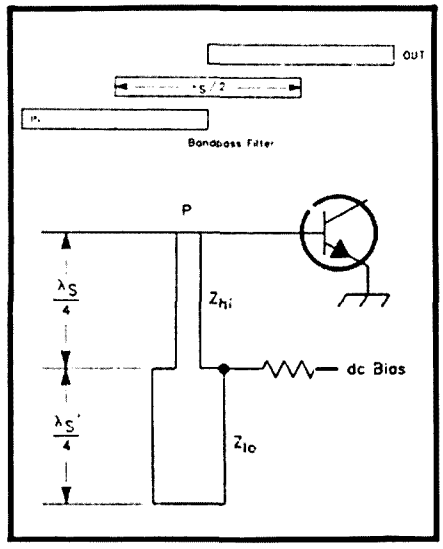


Figure 2 — Stub Decoupling.

impedance where the dc bias circuit is connected. This point is connected to the base circuit at P by another quarter wave line of higher impedance, the narrow one, where the low impedance has once again become a high impedance and so does not load the circuit. This may also be referred to as a half wave line. The reason for the differing impedance of the quarter wave lines is to maximise the effectiveness of the configuration.

A complication arises in that the quarter wave lengths will be different lengths due to the line characteristics and that the transition point is not as well defined as the designer may wish.

There are thus some uncertainties in making the design work as expected. This may result in some unfortunate results and some cut and try design.

The way around the problem is to use a radial line stub which is shown in Figure 3 and Figure 4.

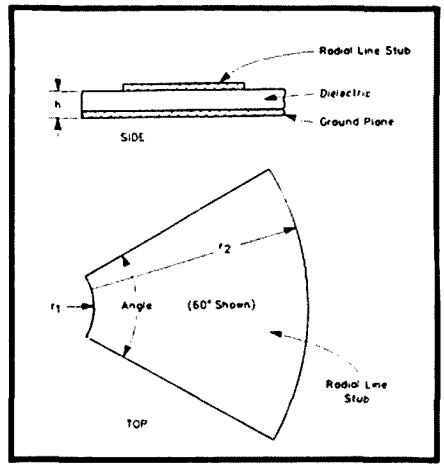


Figure 3 — Radial Line Stub.

This has a broad resonance region and also exhibits a well located attachment point. The stub is an angular sector of between 60 and 90 degrees. The attachment point is at the centre where the radius is r1. See Figure 4.

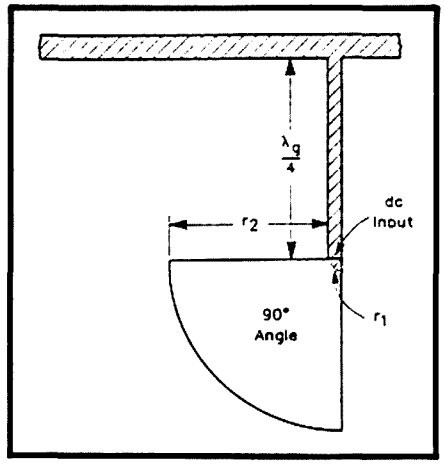


Figure 4 — Radial Line Stub used for Stub Decoupling.

Intending constructors should obtain the source article as the calculation is dependent on the material used and the angle used for the stub.

10 GHz FM ATV Transmitter

A simple 10 GHz FM ATV transmitter appeared in the Rad Com column Eurotek by Erwin David G4LQI. The original was in Old Man

Sept 1992 by author M Vonlanthen HB9AFO.

The details of the 10 GHz oscillator are shown in Figure 5.

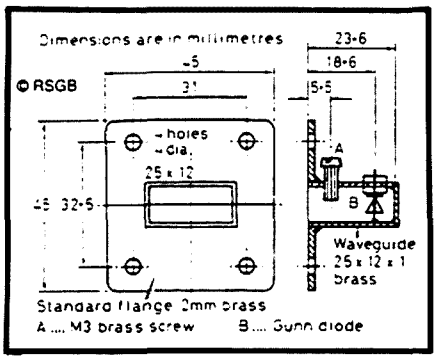


Figure 5 — The Gunn Diode 10 GHz Oscillator.

Alternatively a commercial assembly could be used.

An Iris with a 7.8 mm diameter hole is used between the oscillator and the horn antenna to control loading of the oscillator. The horn antenna is shown in Fig 6.

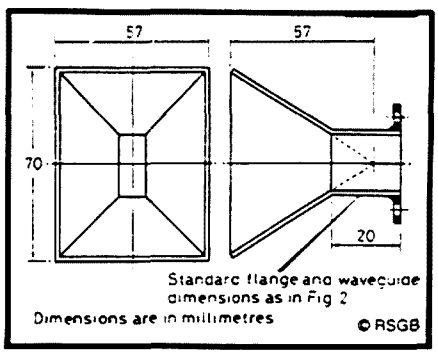


Figure 6 — Simple Horn Antenna 15 dB Gain.

The modulator is shown in Fig 7. The video signal is connected to the voltage divider in the voltage regulator circuit. This provides loading for the video source and couples it into the voltage regulator modulating the output voltage. The voltage output should be set for the best result with the Gunn Diode.

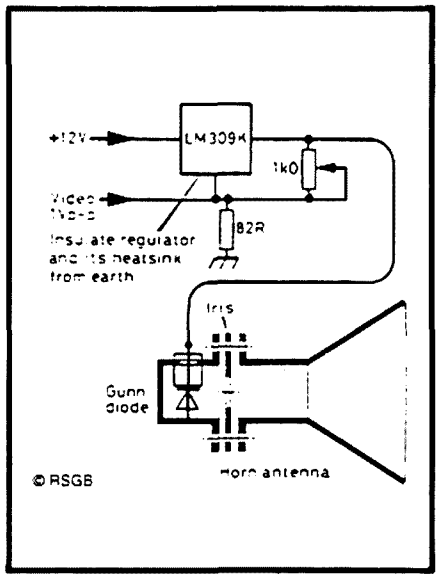


Figure 7 — Frequency Modulated 10 GHz ATV.

Some interactions should be expected but it is a very simple circuit. Even at such low power levels care should be taken not to look into the antenna or waveguide and keep away from the open end when transmitting.

ar

WIA News

Spectrum Management Matters

The Radiocommunications Act 1992 will come into effect on 1 July 1993.

Several major reforms are introduced by this new Act, the major one being the establishment of a "market-based" system of spectrum management in selected parts of the spectrum. Fortunately, the amateur bands are exempt.

The new Act will be administered by a Spectrum Management Agency (SMA), currently being set up, which will supersede the role of sections of the current Department of Transport and Communications (DOTC).

A release from DOTC in February advises that "users will be consulted by way of the newly established Radiocommunications Consultative Council."

Meanwhile, in Geneva, Switzerland, major reforms to the structure and functioning of the International Telecommunications Union (ITU) were included in a new ITU Convention and Constitution, taking effect from 1 March.

Part of this reform does away with the old World Administrative Radio Conferences (WARCs), held every decade or so, replacing them with "mini-WARCs" to be held every two years to deal more effectively with changing demands on the radio frequency spectrum.

These will be administered by a newly-established Radiocommunications Bureau. For the WIA, this means more constant work on international matters and more frequent attendance at overseas meetings.

In addition, the ITU has established a Telecommunications Standardization Bureau to "deal more vigorously with the development of standards for telecommunications services, including radio-based technologies."

WIA Policy Revamps

Continuing with publication of the 12 revamped Federal Policy items, commenced in last month's WIA News, this month we present three more, covering

Gentleman's Agreement

This Board NOTING:

The strong desire to attain high level of self regulation and self discipline within the amateur radio service whilst retaining maximum flexibility of use of bands;

The conflicting needs of various modes as regards necessary bandwidth, susceptibility to interference from adjacent signals etc;

The increasing numbers of stations using amateur bands;

The desire to guide newcomers into habits likely to achieve easy assimilation into our service;

The need to establish special purpose nets, new and different mode nets, whilst encouraging the best use of bands and further experimentation into new techniques.

This Board RESOLVES:

Each MF and HF amateur band (including any new allocations) be governed by a "Gentlemen's Agreement" such that it is divided into broad segments viz:

CW

Narrow Band Modes

Wider Band Modes;

Such agreement to be coordinated world wide or at least Region wide so as to achieve minimum conflict;

Special purpose and different mode nets and operations not available to Novice licensees be conducted outside Novice segments;

VHF/UHF/SHF bands be planned nationally along similar lines, as at present;

Such agreements and plans should be widely publicised to all new and existing licensees through publication of the Australian Amateur Band Plans. Furthermore all licensees be strongly encouraged to adhere to the spirit and principles of such plans.

References:
Previous version: 82.092/1 Appendix C3
Revised: May 92 & Jul 92 Board meeting
Adopted: Oct 92 Board meeting

Narrow Band Modes

This Board NOTING:

In 1986, Federal Council adopted and published in "Band Plans for the Amateur Radio Service" the following definition. "Narrow Band" designates narrow band modes (other than CW) occupying band widths less than 1.12 kHz. Narrow band modes use an appropriate modulation technique and speed to stay within the designated bandwidth. They can include ASCII, RTTY, AMTOR and Packet Radio.

AOCP and LAOCP are minimum licence requirements for narrow band mode transmission;

The desirability of agreed calling frequencies and frequency allocations for such transmissions;

The different types of store and forward repeaters being developed;

The different types of narrow band modes in use and being developed;

The increasing number of narrow band mode users;

The need for agreed technical and other standards.

DOTC regulations permit the following types of emission:

— 1K12F1A/F1B/F1D: Frequency shift keying using a frequency shift of not more than 850 Hz;

— 6K00A2A/A2B/A2D: Audio frequency shift keying by amplitude modulation of a carrier by a keyed audio tone. The occupied bandwidth not to exceed +/– 3 kHz.

— 6K00F2B/G2B/G2D/F2A/G2A/F2D: Audio frequency shift keying by frequency or phase modulation of a carrier by a keyed audio tone. The occupied bandwidth not to exceed +/– 3 kHz.

DOTC regulations permit the use of any internationally recognised code, including;

Baudot	CCITT2
ASCII	CCITT5
AMTOR/SITOR	CCIR

This Board OBSERVES:

The following technical standards for extant modes:

Commonly used standard shifts are 170 Hz, 425 Hz or 850 Hz. The recommended shift for amateur use is 170 Hz.

The standard tone pairs used are:

	Low tones		High tones	
Shift	Mark	Space	Mark	Space
170	1275	1445	2125	2295
425	1275	1700	2125	2550
850	1275	2125	2125	2975

(Note: tones given in Hertz)

The use of either high or low tones will be governed by the individual's choice and may be determined by the pass band of the transmit audio circuits and/or IF filter. On VHF/UHF high tones are recommended where possible for compatibility.

The standard transmission speeds (baud rates) commonly used are:

AMTOR	— 100				
Baudot	— 45	50	57	75	100
ASCII	— 110	150	300 upwards		

It is recommended the following speeds be used for MF and HF transmissions:

AMTOR	100
Baudot	50
ASCII	110

The standard formats commonly used and recognised are:

AMTOR: 7-unit code (synchronous)

Baudot: 7.5-unit code (1 start, 5 data, 1.5 stop)

ASCII (110 baud): 10-unit (1 start, 7 data, 2 stop)

ASCII (300 baud up): 9-unit (1 start, 7 data, 1 stop).

Recommended frequency segments and calling frequencies are as published in the Australian Amateur Band Plans.

and RECOMMENDS

Technical and operational standards and practices should be researched and promulgated for the benefit of existing and future users of these modes and as part of an awareness program for the benefit of non-users.

Liaison with operators groups re technical standards and operating practice shall be the responsibility of a member appointed for the purpose to the panel of FTAC.

Regulatory requirements for all narrow band modes, as well as for store and forward repeaters should be researched and amendments suggested where necessary.

References: 85.04.08/2
Previous version: 84.09.04 Appendix A
Revised May 92, Jul 92 Board meeting & Oct 92 Board meeting
Adopted: Oct 92 Board meeting

Amateur Television

This Board NOTING

The high degree of expertise required by amateur radio licensees in the transmission of television pictures on the amateur bands,

RECOMMENDS

The encouragement and promotion of the development of advanced ATV modulation modes in keeping with modern technology, eg VSB, FM, digital and narrow band ATV;

Promotion of 1296 MHz and above for ATV use;

Encouragement of publication of articles on ATV in Amateur Radio magazine;

Promotion of training programs and weekend workshops on ATV;

Production and transmission of technical training films or video tapes concerning amateur television and related subjects;

Utilisation of the skills gained in ATV to produce video tapes on technical amateur radio subjects for circulation to regional members and clubs;

The siting of every ATV repeater should be thoroughly researched bearing in mind the peculiarities of TV transmissions in comparison to other modes. Note that because of the limited number of ATV channels available, all applications to DOTC for an ATV repeater licence should go via the WIA for co-ordination;

Appointment of a Federal ATV liaison officer as a panel member of FTAC. This Officer to be responsible for liaison between ATV groups in each state on matters including;

technical standards for repeaters,
ATV channel allocations,
exchange of technical information,
organisation of publicity and training, and
liaison with the Federal Video Tape Co-ordinator re
production and distribution of training material.

The WIA make the fullest possible provision for ATV simplex, in-band repeaters and cross band repeaters in its band plans, bearing in mind the need for spectrum efficiency and the spectrum needs of other modes.

The WIA seek an ATV allocation in the 600-950 MHz region to replace the 50 cm band.

References: 78.1215 80.126 81.124
Previous version: 84.09.14 Appendix A
Revised: May 92 & Jul 92 Board meeting & Oct 92 Board meeting
Adopted: Oct 92 Board meeting.

IMPROVING SELECTIVITY BY PRE-SELECTOR

*Robert R McGregor VK3XZ * says "You must hear them to work them!," and tells us how!*

It is signal reception that makes it worthwhile to put up "a piece of wire" to produce radiation, and to transmit a signal (ref 1).

Any conductor in an exposed position will intercept radiation quite impartially, 10.2 kHz Omega to GHz satellites. Appropriate type and sized reflectors can be used to concentrate the radiation onto a collector for improved signal strength.

In the sea of signals there is, we hope, one of interest to ourselves. The objective is then how best to select it in preference to the multitude. In our jargon, tune it in whilst rejecting other signals — selectivity, elevate it above the incoming and the receiver's internal noise — signal/noise ratio and de-modulate it.

Superhet Penalties

The superheterodyne method of reception is almost universal, but this piece of technology has a few built-in penalties. The locally generated oscillation must be very stable and free of noise or harmonics. There are two, in fact, several, signals since the converter is efficient at harmonics of the oscillator frequency, that can be heterodyned to produce the intermediate frequency (IF). The most important is the Image frequency, the alternative signal that is also displaced by the IF from the local oscillator frequency.

The second important factor is that all mixers are noisier than amplifiers, so that for minimum noise all mixers should be preceded by a low noise amplifier of sufficient gain that is the determining factor on internal noise in the receiver.

The third consideration is the maximum input signal level at the input before any stage preceding the main "selective amplifier" overloads and itself becomes a mixer of all the incoming signals — inter-modulation. This results in many spurious signals and degradation of the desired signal. The continuous increase in output power by all services has worsened this problem. The original valve receiver could cope up to 250 mV, and with the use of beam switching valves — several volts. Transistors will accept 50 mV and later double balanced mixers above 100 mV.

Mixer Overload

The mixer stage is usually the most vulnerable to overload, and pre-mixer gain for low noise reduces this overload ability. There has to be a trade-off; a maximum gain of 10 to 20 dB, with provision to reduce this to 7 dB or less when the signals are strong. Study concluded? Well, not quite. If we examine the current design philosophy, it certainly provides gain reduction before the mixer, even switched pads at the Rx antenna input, but minimal pre-mixer selectivity, yet this aspect is equally important!

The receiving antenna itself can make a considerable contribution. It should provide the best signal/noise pick-up with just sufficient signal level for clean de-modulation and not enough for inter-modulation. There should, if possible, be a limited vertical and horizontal reception — directivity — with a null for strong local signals being a plus. Tuning with a high-Q circuit reduces the frequencies it will accept.

Always consider a pre-selector for DX, and for serious work below 7 MHz in a metropolitan area, a high pass filter to reduce B/C fundamentals. A current advertisement in AR for a very high grade receiver proudly proclaims two tuned circuits before the mixer, so also with Drew Diamond's converter in AR, June '91. First class receivers in the late "30s had three tuned circuits of excellent Q, and there are reports of HF receivers in very difficult situations having five and six tuned circuits preceding the mixer!

Faraday Screen

Centre-fed short horizontal and vertical dipoles with a tuned feeder system are suitable for initial signal selection. The coil in the tuned system is inductively coupled via a Faraday static screen that intercepts common mode signals on the feeder and allows them to be bypassed to ground. A link coil then couples the tuned coil to the 50 ohm Rx input. Fig 2 is for solenoids, Fig 3 is for toroids.

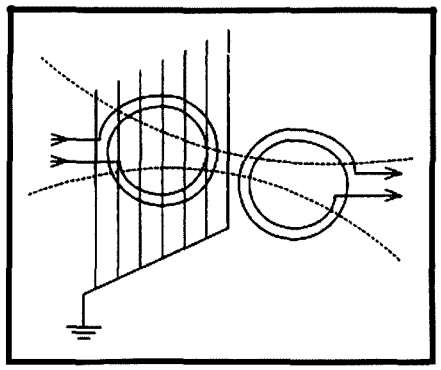


Fig 1 — Principle of Faraday screen

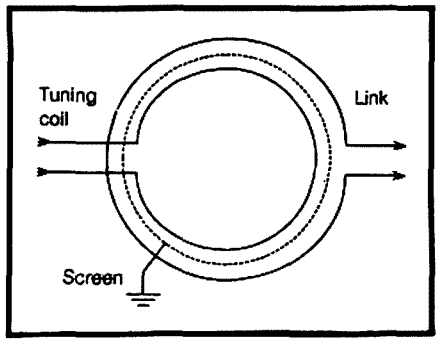


Fig 2 — End view

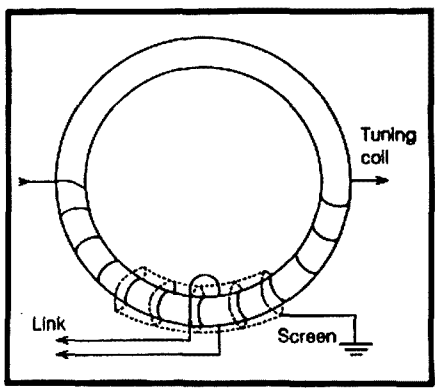


Fig 3 — Plan. Toroidal core

The use of a very high IF will spread out the primary and secondary images but have absolutely no effect on reducing intermodulation problems. Only some form of tuning at signal frequency, together with input level control, can reduce the "pile up" at the mixer. Broad-banding is fine for transmitters and their antennas. It is no asset to reception between antenna and speaker.

Separate the Rx and Tx antennas if possible, and always protect the Rx input with a shorting relay and back-up diodes. Two 3 m fishing, curtain or bamboo poles, some ingenuity, 300 ohm ribbon and a tuned circuit puts you in business.

Wind spaced turns of 0.5 mm or 20 amp fuse wire over a plastic film on a former the size of the coil to be screened. Solder on a shorting bar and leave a tail. Cement the wire to the sheet and cut the winding longitudinally for removal, and place over the coil. See that the ends do not touch; they can overlap. Use insulated wire for the link coil.

References

1. "A Piece of Wire", McGregor, AR May '91, p 20.

Editor's Note:

While early valve equipment had high Q tuned RF amplifiers, sometimes several, the designer had little option. The valve is a high impedance, high capacitance device. The only way to handle the capacitance at radio frequencies was to make it part of a resonant circuit. The Q of the resonant circuit was set as performance demanded. The broadband, untuned RF amplifiers common in modern solid state equipment would have been impossible with valves....VK3ABP.

** 2 Wiltshire Drive, Somerville 3912*

ar

Remember to leave a three second break between overs when using a repeater.

AMATEUR RADIO EQUIPMENT PRICES

Gil Sones VK3AUI

The price of transceivers seems to move inexorably upward. Often comparison with what we remember paying leaves us feeling we are being priced out of the market.

Memory of the good old days is somewhat unreliable particularly with regard to prices, wages and our life styles. Both wages and prices have spiralled upward and there has been some readjustment of taxes and other costs. We have come to expect a wider range of appliances and electronic goods. True the relative cost of the electronic goodies has dropped and they are now more affordable.

When HF SSB transceivers arrived in the mid 1960's the price of 300 pounds or $600 may seem very reasonable to us today. However in today's money the price is equivalent to $4000 approx. Not so very different to the upper end of today's transceiver market. The early transceivers had none of the refinement of today's transceivers. One VFO and one filter and that was about it. Even our current basic transceivers have more features and performance and they cost half the price.

In 1970 the FT101 arrived and the price then was $525. This was quite an advance on earlier transceivers but there was still only one VFO. In today's money the price is equivalent to around $3000. Not quite so good for the features and performance.

The Ken KP202 arrived in 1973 and at $150 it would seem cheap. However that only brought a few channels and today it represents a price of around $700. Not quite so good when compared to a modern two metre handheld.

Icom released the IC22S in 1976 and from $220 up to $299 in the late 70's they were good value. Today the initial price represents $600 approx. More or less close to today's prices but the modern radio is much more sophisticated.

The modern HF transceiver really got going in the 1980's with the benefits of technology giving us small, light, many-featured transceivers at from around $1300 up. True, if you want more features you can pay more, but the transceiver becomes quite sophisticated around the $2000 mark.

ar

TRY THIS

Make your own polystyrene solution

*Graham Thornton VK3IY **

Those of us who can remember the good(?) old days of coil winding will recall the use of polystyrene coil dope. This was used to provide a low-loss sealant and to keep the turns secure. If you want to get a strange look from your component store salesman, ask for some! However, all is not lost — it's quite easy to home-brew.

There is an abundance of waste expanded polystyrene in the environment, ie "styrofoam". This dissolves readily in ordinary turpentine. The fizz given off is the release of normal hexane used to expand the polystyrene (beware — inflammable). It takes quite a volume of this material to make a little solution. The polystyrene is not soluble in every component of the turps. The end result is a two-layered solution. The viscous lower solution is the desired result. Simply pour off the supernatant liquid. (No need to waste it — it's still useful turps).

It can be applied with a small brush. It seems to take overnight to dry. The same material can be used to make castings for insulators, if desired. Dowelling spreaders, dried in the oven, and painted with this solution, are excellent for transmission lines, eg tuned feeders.

** 1/7 Alfriston Street Eiwood Vic 3184* ar

Modifying the Philips FM-828 to auto-scan

*Ron Graham VK4BRG * describes his thoughts, and provides examples for a simple and very useful modification.*

Over the past few years, a number of these radios have been acquired by amateurs and used for voice and digital repeaters where their robust nature and reliability have been proven. I am also aware that they have been used for dedicated packet and voice applications in the shack. My requirement for auto-scan was due to having two voice repeaters in the area that I wished to monitor without tying up my main two-metre radio. As more of these radios seem to be coming available, and I feel sure others could be in a similar position of wanting to scan two or more frequencies, these notes may be of use.

The VHF bands are covered with the 828 in the following frequency ranges: A band: 146 to 175 MHz; B Band: 132 to 157 MHz; and E Band: 68 to 88 MHz. I have not seen the Band C, which nicely covers the 2m band, but the Band B will cover all the 2m band. This model, which covers the high VHF commercial band, is currently being phased out of that service, and is the model I have used.

Different models

Mark I and Mark II, together with both remote and local control models, are available. The Mark I is easily identified as it has a stainless steel case; whereas the Mark II has a black case fitted with quick release catches. The RF boards are essentially the same in both types, but the receive audio/power supply boards are quite different. However, electrically they carry out similar functions. Naturally, I would give preference to the Mark II, but the Mark I is quite useable. I also prefer the local control model, though the remote control model may suit some installations. I have modified remote models to local control, but it is quite an undertaking.

"I decided to scan three channels, and have utilised fairly basic circuitry."

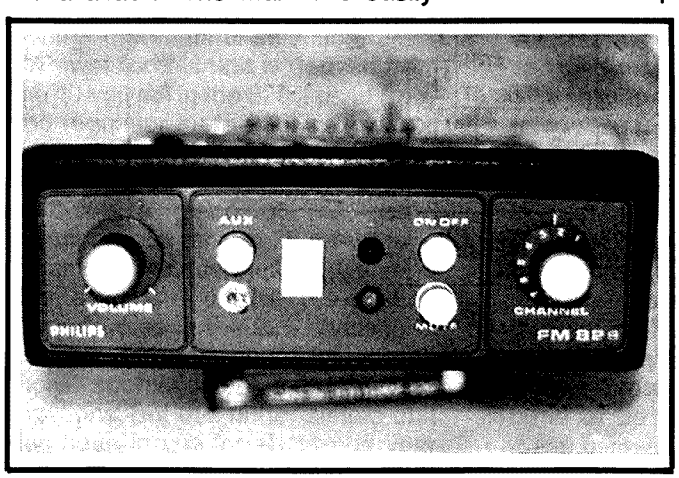
The basic radio will accommodate up to three oscillator stages/channels on each of the receive and exciter board, although components may be fitted for only one. Extra channel components are normally supplied as a kit, though most components are standard except the "frequency adjust" coil in series with the crystal and the sleeves used as the crystal socket. Hopefully you can find a suitable former and core and wind the few turns required for the coil, duplicating the turns as per the existing coils. Be warned that the RX and TX coils are not the same. The crystal socket sleeves look like elongated blind eyelets. I have seen suitable crystal sockets in CB radios, maybe a standard eyelet would be suitable, or the crystal soldered directly into the board.

So you will have three simplex or duplex channels available once you have achieved the above. Should you require more channels, there is an accessory board available which accommodates seven more TX and RX oscillator stages, bringing the total to 10 channels. If you are not able to acquire that board, it would be possible to duplicate the number of oscillator stages required on a piece of vero-board.

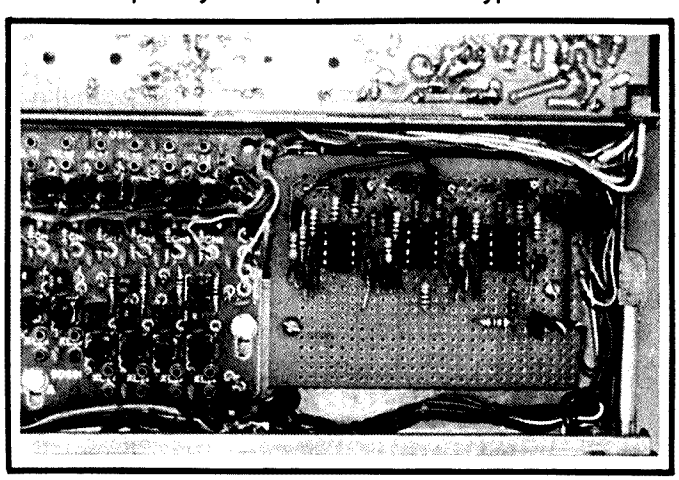
Manufacturer's information

It will be necessary to obtain a copy of the tuning instructions and the schematic (if not the complete) service manual. Your local two-way radio dealer may be able to help in this regard.

From the schematic you will see how each oscillator stage is switched to select channels by earthing the emitter of each of the respective RX and TX oscillators. Should you start with a single channel radio, this switch probably will not be fitted as, of course, it is not required. The two channel radios I have seen have had a two-position slide-type switch fitted.



Modified front panel of the Philips FM828 showing the scanning switch.



The modifications on Veroboard installed inside the FM 828.

The multi-channel types have a rotary switch which can accommodate the 10-channel maximum if required. Naturally, if you require more than two channels, it is easier to try to locate a radio with this type of switch already fitted. You can then switch channels manually, which makes the initial tuning easier and, indeed, I have left this switch fitted to enable manual selection of channels even though the radio has been modified for auto-scan.

Number of channels

The above information should give some overview of the 828 before commencing the modification. I decided to scan three channels and have utilised fairly basic circuitry. I think this approach may be suitable for up to, say, four channels, but could become unwieldy both electrically and physically above this number. Should you wish to scan a greater number of channels, a different technique such as a 555 clock driving a 4017 or 4022 counter IC may be more practical.

Referring to the schematic diagram, you will note the 555 timers in the monostable mode are cascaded in a ring circuit to provide the required sequential channel switching. The resistor/capacitor combination on pins 6 and 7 govern the scanning speed . . . the values specified give about one second per channel. The reason for the lower supply voltage to the 555s is to enable the timers to be "stopped" with the application of the higher voltage on pin 5 (control) once a receive channel becomes active. The carrier detect signal from pin 13 of the 828 RX board via an inverter, Q4 (PNP) is applied to that pin 5 of each 555 to stop and hold the scan while a receive channel is active. The scan will recommence once that receive channel is free.

The switching signal from each 555 drives a transistor inverter which in turn is used to switch on the respective pair of the radio's oscillator stages. The LEDs and associated series resistors, shown dotted in the schematic, are invaluable in de-bugging the timers. When these timers are operating correctly, the LEDs will light in sequence with each activated channel. They could, in fact, be mounted on the front panel of the radio to indicate the channel number, or frequency, that is currently being scanned or selected.

Indication

In fact, the above is really the easiest method of channel indication. I decided to press on and use a 13mm common anode seven segment display which was mounted on a small piece of vero-board. This vero-board was also used to mount a number of diodes to select, brute-force wise, the required segments of the display for each channel . . . one to three. Here again, if you wish to indicate more than, say, four channels, this approach becomes unwieldy, and a display driver IC would be a more elegant solution. Fitting that indicator assembly in the front panel of the 828 and keeping the rear of the assembly clear of the chassis casting that divides the RX and TX boards proved to be a major exercise, due to the limited space available. However, the result is somewhat more pleasing than I imagine the LED indicator system would be.

I fitted a double pole double throw switch (DSE Cat P-7684) to the front panel. This switch is spring loaded from one side, centre off and a normal switch position on the other side. These positions are labelled "start scan", "scan" and "manual"

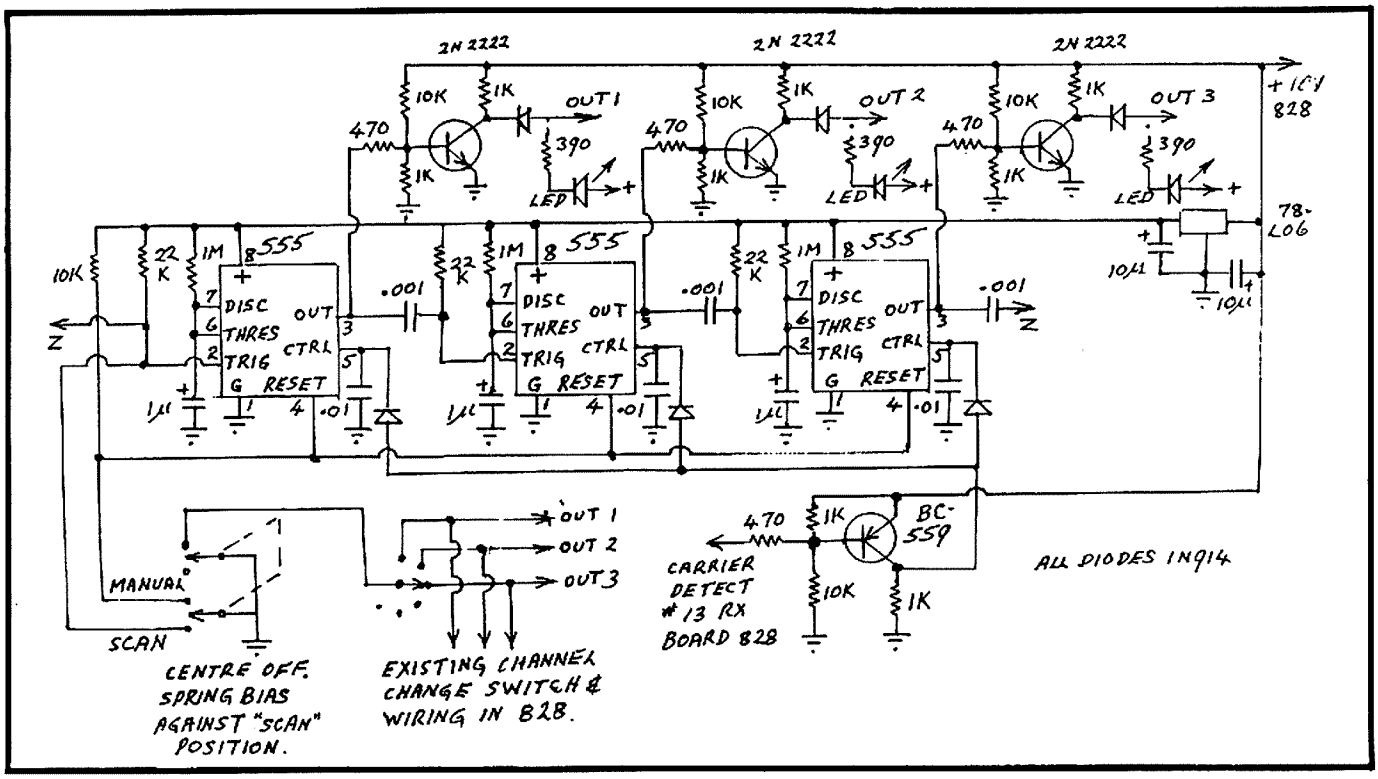


Figure 1 — 828 Auto Scan Schematic (VK4BRG).

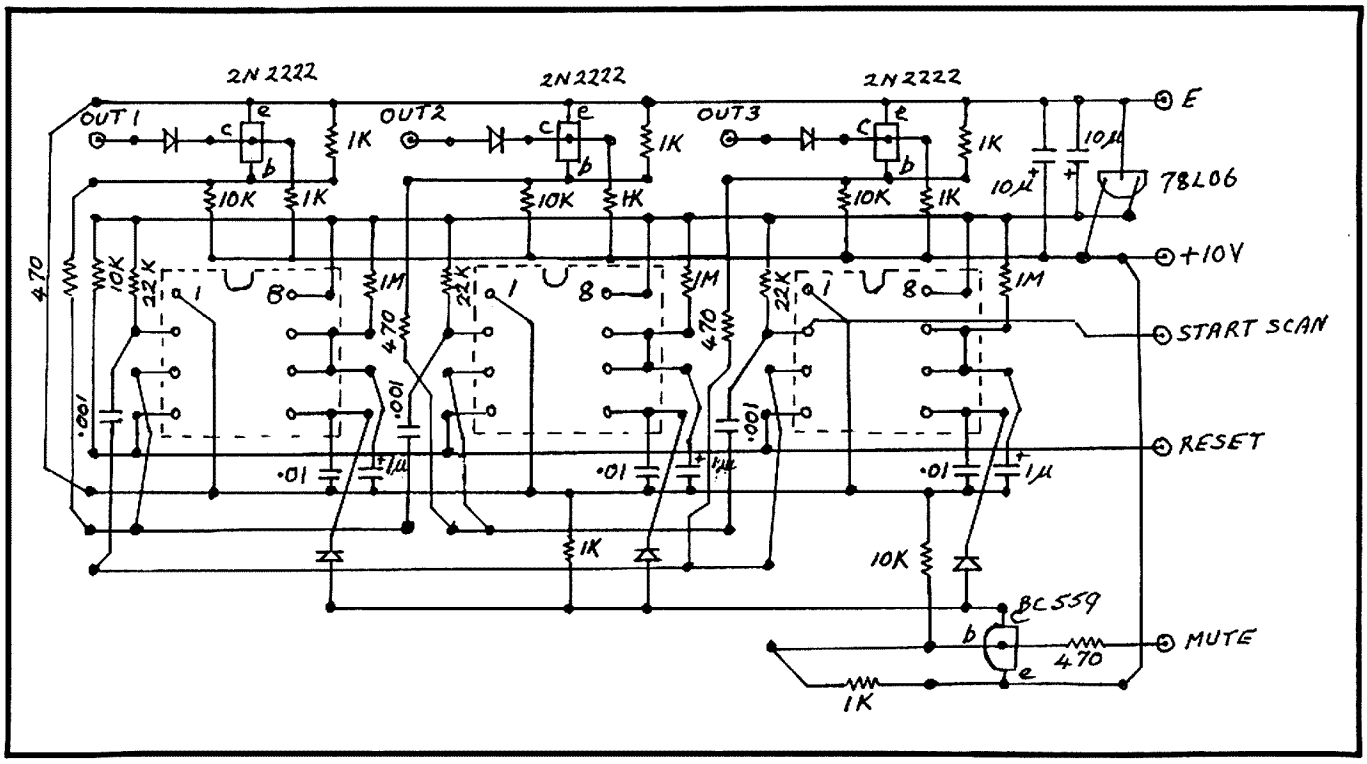


Figure 2 — 828 Auto Scan Layout (VK4BRG).

respectively. From the schematic you will notice that pin 2 of one 555 is switched to earth with the spring loaded section. This is necessary to initially manually trigger the scan circuit. (One could possibly arrange for this to be done automatically at switch on). The manual position of the switch leaves the radio's rotary channel change switch connected normally (to enable manual channel selection) and also inhibits the operation of the 555s by grounding the reset line. The centre off (scan) position disconnects the rotary switch and allows the scanning circuits to control the channel selection.

Power for this unit is derived from the 10-volt rail in the 828. I used a six-volt regulator for the 555s; however, the more common five-volt regulator should be satisfactory. The unit is built on a piece of vero-board measuring 60 mm x 75 mm and is mounted on spacers with 6BA screws into a couple of the pre-existing tapped holes in the 828 chassis.

There is obvious scope for utilising more sophisticated circuitry and functions, but this rather simple unit has been in use for about one year and prove quite satisfactory. The relatively slow scanning rate currently used could be accelerated somewhat, as I think some very short calls are missed.

Some notes on vero-board layout/construction

1. The scale used is 3x full size.
2. All horizontal lines on 0.1 grid are vero-board tracks.
3. The link in the start/stop scan circuit is on the track side of the board.
4. All vertical links are on the component side of the board.
5. Some of these links, together with some component leads, will need to be insulated with heatproof sleeving where the possibility of shorting may occur.
6. The links to pin 1 of the 555s are fitted prior to fitting the IC sockets.
7. Take particular note of where the vero-board tracks need to be cut. In most instances there is a vero-board hole between the ends of the tracks. I used this hole as a guide for a sharp 5/32 drill to cut tracks. One suggestion would be to photocopy the layout and mark with a cross where the tracks need to be cut. I tried to mark these crosses on the layout, but the extra detail cluttered the layout.
8. Matrix board pins are used for external connections, marked as a dot with a small concentric circle.
9. Soldered connections are marked with a dot.
10. Actual specific details/dimensions of mounting the board, toggle switch and channel indicating system is left to the individual constructor due to the possible variations involved. The size of the board given will fit together with the multi-channel board; however, there is then no room for the internal speaker.

* *PO Box 323, Sarina Qld 4737*

ar

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe palce.

AMSAT Australia

Bill Magnusson VK3JT *

Over-the-horizon DX through the RS satellites

Reports have been coming to hand, mainly from Europe on the subject of working quite extraordinary distances via the RS series satellites. When mode KA is operating there are alternate uplinks available on 2 metres and 15 metres. Even though the 2 metres path to the satellite disappears almost immediately it goes over the horizon, it seems that the 15 and 10 metres propagation can carry on over much longer distances. This is going to depend heavily on prevailing ionospheric conditions of course. The satellites are skimming around just outside the ionosphere. Low angle refraction, ducting and other effects can account for such propagation. Back in November 1974 P L Dyson of LaTrobe university, Melbourne described experimental evidence of these effects using data from the OGO-6 and ISIS-1 and 2 satellites in the Proceedings of the IREE. This report contained some rather surprising revelations, one of which was that the region of space where many low-earth-orbiting satellites are located can quite properly be considered to be part of the ionosphere. Dyson (and others) claim that F layer irregularities can extend for large distances along the earth's magnetic field lines and to quote Dyson, "When the satellite is within one of these irregularities radio pulses transmitted by the sounder can be trapped by the irregularity and guided or ducted from one side of the earth to the other". Reports from Europe suggest that inter-continental contacts are regularly made over the north pole between Europe and America. I wonder if any RS satellite operators in our part of the world have tried this mode. It sounds very interesting. I can't work it myself due to a rather high noise level at this QTH so I'd like to hear from anyone who can give some details of contacts made from VK via this mode. Claims have been made of contacts having taken place through 2 satellites "in series" to even further extend the range. This would be a rare occurrence as the likelihood of co-visibility at the right time is remote. Remember that normal terrestrial origin signals can be heard in the RS pass-bands so you will need to verify that you are actually hearing signals from RS by listening for the beacon or transponding a signal through the satellite.

A new approach to squint angle measurement

Well known satellite guru, James Miller G3RUH has done it again. James has come up with a method of determining the squint angle, (the Americans call it off-pointing angle) using directly observable data obtainable from the satellite at any time. It relies on the satellite antenna being mounted slightly off centre to the axis of spin. It is normal for at least one antenna to be so mounted. Rotation will cause very small but measurable phase differences in the received signal. James has devised a method of resolving the data to give a very accurate read-out of squint angle which is independent of the usual sun and horizon sensors. These sensors are sometimes unusable for long periods due to eclipses and sun blinding. This development occurred at a most fortuitous time when eclipses were indeed affecting the readings during a recent re-orienting of AO-13's attitude. A full account of this important development appears in the Feb '93 issue of "Oscar News" from AMSAT-UK. It's well worth reading.

AMSAT National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.
Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).
Secondary 3.685 MHz. (Usually during winter).
Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Arsene up-date

At the time of printing the best information to hand regarding the launch of Arsene indicates a launch on or about 20th April 1993. The orbit will be high altitude, slightly elliptical and most importantly, equatorial. What does this all mean? Well, it will be the first satellite of the phase 3 family which will be equally useable for stations in BOTH hemispheres and will provide long periods of good inter-hemisphere DX each orbit. With an apogee of about 36 000 km and a perigee of about 20 000 km it will exhibit a sky-track unlike any previous amateur radio satellite. With three axis stabilisation it should offer excellent squint angles to all users even at perigee. Available launch opportunities have so far restricted the orbits of the phase 3 birds to high inclination, highly elliptical orbits. Other factors such as radiation susceptibility and power budget also come into orbit selection. These orbits have heavily favoured one hemisphere or the other, (usually the heavily populated northern hemisphere). In the August 1992 column I gave a set of "keps" to allow you to model the orbit. Put them into your favourite tracking program and have a look. If the launch goes according to plan I'll devote the column next month to a complete run-down on this satellite.

MIR crew change

The new crew on board MIR seem to have settled in nicely and amateur radio operations have become a regular part of their routine. Some initial problems with the TNC and software have all been resolved and regular packet and voice operation has been observed.

The new crew are: U9MIR Gennady Manakov R2MIR Aleksandr Poleschuk

They are due to return in late July 1993, to be replaced by:
R3MIR Vasily Zibliev
R4MIR Aleksandr Serebrov, who will remain on board until late November 1993.

AMSAT-UK satellite frequency guide

I received a parcel by post recently from Ron Broadbent G3AAJ of AMSAT-UK. He had read of my intention to publish the frequency list in last month's column. Ron sent me a copy of their "Satellite Frequency Guide". It is a very complete and up-to-date list of all transponders and beacons. Available in clear plastic from AMSAT-UK at 2 pounds 45 p Sterling posted to VK personalised with your name or call-sign. The address for all communication with AMSAT-UK is 94 Herongate Rd, London E12 5EQ.

Software Review

Many satellite operators rely heavily on packet radio for vital operating data, eg latest news, keps etc. I've recently been testing a new piece of packet terminal software called TPK. It works in conjunction with the F6FBB bulletin boards to make your station virtually fully automatic. You can select the information you require and it is automatically down-loaded into your system. All automatic up-loads and down-loads are done in compressed form thus saving considerable channel time. A major attraction of this software is that it does a lot of its work in un-connected mode. To this extent it works rather like the broadcast protocol operating on UO-22. The software is available from the Melbourne Packet Radio Group Inc and is well worth a look.

AO-13 report

At the time of writing we are coming into a period of good long DX windows from VK to Europe and North America. The recent (and on-going) eclipses have disrupted the schedule but Graham, James and Peter have done a remarkable job in juggling the attitude to give the best possible operating opportunities consistent with a safe power budget. Take advantage of these good conditions while you can. Indications are that the predicted demise of AO-13 due to eccentricity perturbations is only 2 or 3 years away. During that time however we should see many repeats of these good DX conditions.

* *359 Williamstown Road, Yarraville VIC 3013, Packet: VK3JT@VK3BBS*

ar

How's DX

*Stephen Pall VK2PS **

In November last year I asked you to voice your opinion about the proposed space cuts to this column by the production editor. Over the three months following, a total of 23 letters and faxes arrived at my desk; also a few phone calls. All those readers who took the trouble to put pen to paper were very supportive of this column; none of them wanted to be cut. Some of them suggested certain alterations to the presentation. For your information the number of readers from each Division who responded is as follows: VK2 = 6, VK3 = 4, VK4 = 4, VK5 = 6, VK6 = 1, VK8 = 2. There was no reaction from VKs 1, 7 and 9. Five of the letters came from "closet DXers" of whom I never heard, worked or read about before.

The copies of your letters were sent to the management of AR (publisher, editor, production editor and federal media officer), with a five-page submission on my part which essentially suggested that a minimum of two pages to a maximum of three pages should be allowed for the "How's DX?" column in each issue. Mr Bill Roper VK3ARZ, who is the official publisher of the magazine and general manager and secretary of the WIA, in a letter to me dated 23 February, said this, among other things: "I will ensure the editors make every effort to allow you an average of two pages per month."

The matter rests here. Thank you — all of you — for your loyal support. I will acknowledge your letters and thank you individually by replying in the coming weeks.

Spratly Islands — 9M0S

News of this DXpedition came too late to be included in the March issue of AR. This expedition was to have taken place between 11-17 March. The island group is located in the South China Sea and it is a very much disputed territory. Some of the individual islands are claimed and occupied from time to time by the military from the People's Republic of China, Vietnam, the Philippines, Malaysia and Taiwan. It is rumoured the islands and the immediate waters around them are rich in oil, which would partly explain their dangerous nature. Small skirmishes between warring parties made the islands not only dangerous, but also made them one of the most sought-after countries in the DXCC "most wanted" list. Eleven amateurs from five countries were to operate as 9M0S from Pulau Layang Layang Island, which is located about 165 miles north-west of Labuan Island on the west coast of Sabah. The island was previously known as Swallow Reef. The Malaysian Royal Navy will provide the necessary escort and protection for the 45m MV Coral Topaz which will carry the expeditioners. QSL cards go via INDEXA c/o W4FRU, John Parrott, PO Box 5127, Suffolk, VA 23435, USA.

News from the DX Advisory Committee (DXAC)

The DX Advisory Committee (DXAC) of the ARRL has voted on, or recommended on, the following matters:

- Recommended that the Red Sea Islands (Abu Ail-A15) be deleted from the DXCC Countries list effective 31 March 1991.
- The Committee will submit an operating ethics report to the ARRL. This report is the result of the "disqualification criteria" request following the 3Y5B Bouvet operation.
- Recommended that the Temburong District part of Brunei Darussalam (V85) be not declared as a separate DXCC country.
- Discussed possible changes in the DXCC list for future ballots regarding: Mount Athos (deletion); Eritrea (new country or reinstatement to the existing DXCC list). A popular vote on the question of political independence from Ethiopia will take place in April 1993. The DXAC awaits the result of that vote before it votes on the DXCC status of Eritrea.
- Deletion of ex-Czechoslovakia and adding to the list the new Czech Republic and Slovakia.
- The DXAC is seeking world-wide input on suggested DXCC rules changes that would discourage abuses of the QSLing process. Interested parties may submit examples of poor QSLing practices and suggested changes until 31 August 1993. Any change in the rules must be fair, enforceable and not to place burden on the ARRL, the DXCC desk or the DXing community. Make your submission to the DXAC c/o ARRL, 225 Main St, Newington, CT 06111, USA.

". . . DXCC rules changes that would discourage abuses of the QSLing process."

QSLing practices

There is quite a considerable debate going on at the moment on QSLing practices in the various DX bulletins and magazines. Even the DXAC is asking for submissions on this question. The controversy has been simmering for many years, but came to the boil by the almost total collapse of the safe mail delivery system in certain countries.

Subjects discussed were:

lost or pilfered mail, or total destruction of mail;

missing IRCs or missing "green stamps';

alleged dishonesty of some QSL managers;

the high cost of postage in some European countries, Germany and Austria being the case in point;

the DXCC being blamed that it requires the submission of original cards for its award program.

But before you, the average DXer, start to complain of not getting the card, let's revise the short rules which should apply when QSLing directly to foreign countries.

1. If you think your own mail system is not working, be assured there are many more countries in the world where the mail system is worse, or very much worse and unsafe.
2. Use return envelopes which will fit flat, without being folded, into the envelope addressed to the DX station or QSL manager.
3. Check the QSLing address several times. A misprint or a wrong post office box number will never produce a reply card.
4. Never put any callsign or similar designation "to amateur radio station Joe Blow" on the envelope, never use your own callsign as a sender on the envelope. Some naive amateurs use rubber stamps showing full callsign and amateur radio station on reply envelopes. Open invitation to pilferage.
5. If possible, use a typewriter when addressing the envelope. Use longish type envelopes so they appear as business mail.
6. Use envelopes one cannot see through — even when you hold a light against the envelope.
7. Never use postage stamps if you can avoid it. Use printed labels issued by the bigger post offices throughout Australia. Letters will be pilfered even for the value of the used postage stamps to stamp collectors, to whom these will be sold.
8. Never use sticky tape for additional sealant on letters. Instead use good synthetic glue if you think the original glue will give way to "hot vapour" treatment.
9. If you are sending letters to PO boxes and do not know the name of the boxholder, address your letter to "The Manager", and follow with the box number etc.
10. Remember, in some countries it is illegal to receive money (green stamps) through the mail. Again, in some countries, IRCs are of no use because the country is not a subscriber to the Universal Postal Union.
11. Make sure your QSL cards show the correct UTC date (not the local day/date) and the correct UTC time (not your local time), otherwise the card will be returned to you "not in the log".
12. When you QSL direct, whether within Australia or overseas, always include a return self-addressed and stamped envelope (for overseas mail enclose one IRC or one $US, depending on the information received). Remember, QSL managers are doing voluntary work, and are not rich people. The odd additional green stamp or IRC you might send covers the postage for those who, because of ignorance, do not enclose return postage, but expect direct reply.

Incidentally the full name of IRC is: International Reply Coupon issued by the UPU (Universal Postal Union) and sold by your local post office. The coupon is exchangeable in any country of the Universal Postal Union for one or more postage stamps representing the minimum postage for a priority item or an unregistered letter sent by air to a foreign country.

Future DX activity

- Norm ZL1ST advises that Zenon OD/SP7LSE is with the UN Forces at Naquora in South Lebanon, and will be there at least until 30 August; maybe even until 30 December. Zenon is keen to work VK-ZL-South Pacific stations on 10-80m, both in CW and SSB. QSLs go to SP7EJS Antoni Lichota, PO Box 82, 96-1000 Skierniewice 1, Poland.
- Francis FT5YE is located on the French Antarctic base Dumont d'Urville (66 deg S and 140 deg E. Petrel Island, IOTA AN 017). He will be active until the end of the year. Some of us had worked Francis under his former callsign FT4XG when he was on Kerguelen Island.
- Mohammad, EP2MHB can be found on the European DX Net (14243 at 0600 UTC on Saturdays). His QSL address is Mohammad H Bahrololoom, PO Box 16765-154, Tehran, Iran.
- There is a rumour floating around that Mellish Reef will be activated this year, possibly by an Australian DXer.
- International Marconi Day will be held on 24 April 1993. Approximately 22 international stations have indicated they will take part, having a suffix combination which will include some or all the three letters of IMD in their suffix. A handsome award is available from the Cornish Radio Amateur Club if you work 12 of the active stations.
- SODBA can be heard on the lower end of the 14MHz SSB band in the early hours of our morning (2000 UTC).
- ZD8DEZ will be active from February to August this year.

Interesting QSOs and QSL Information

- VP2VE-14MHz-1122-Feb. QSL to WA2NHA Howard Messing, 90 Nellis Drive, Wayne, New Jersey 07470, USA.
- VP5P-14012-CW-2145-Feb. QSL to WB3DNA Timothy R Fanus, 6140 Chambers Hill Road, Harrisburg, PA 17111, USA.
- T21XO-21006-CW-0600-Jan. QSL to The Manager, PO Box 73, Berlin 1020, Germany.
- VP2MEG-Keith-14236-SSB-1132-Feb. QSL to WB2LCH Gene W Ege Sr, PO Box 64, Gloucester, NJ 08030-0064, USA.
- KE6BL/T5-Brian-14236-SSB-1127-Feb. QSL to K2GX Joseph M Sand, 45 46th Street, Woodside, NY 11377, USA.
- FT5YE-Francis-14152-SSB-1133-Feb. QSL to F1AAS Francis Saugeon, Gauriac, F-33710-Bourg Sur Gironde, France.
- XU-OUN-Ross-14236-SSB-1130-Feb. QSL to VK3OT Steve Gregory, PO Box 622, Hamilton, Victoria 3300.
- 9J2GA-George-21205-SSB-0516-Feb. QSL to George Ada, 56 Datura Av, Luanshya, Zambia, Africa.
- 4N5CN-Jane-1422-SSB-0626-Feb. QSL to Jane Atanasov, Box 73, Kocani, 92300, Republic of Macedonia.
- 3X0HNU/P-14222-SSB-0550-Feb. QSL to F6FNU Antoine Baldeck, BP14, F-91291, Arpajon, Cedex, France.
- 9Y4AL-Tony-14165-SSB-2131-Feb. QSL to Anthony Lee Mack, 62 Alexander Road, Vistabella, San Fernando, Trinidad.

From here and there and everywhere

- If you have not worked Lionel VK9CB yet, the reason is that Lionel is enjoying his extended holiday doing a bit of fishing on Cocos-Keeling. He writes in his letter to me: "I do not want to pose as someone on an expedition. I am not. I operated here in 1960, and again in mid-1992, and now since early in December." At the time of his letter (December) he was still waiting on his beam from the mainland. At that time he had wire antennas strung over the top of two coconut palms. He promised more activity before he goes back to Western Australia. QSL to his home call: VK6LA Lionel Allen, 189 Lockhard St, South Como, WA 6152.
- When sending cards directly to the Baltic States, Estonia=ES, Latvia=YL, Lithuania=LY, it will speed up and make delivery safer if you mark the envelope "via Finland" or via Sweden'.
- News from Albania. The ZA1 T-series call will be replaced with one-letter suffixes. Another 11 such calls were issued after a recent examination. The total number of resident operators in Albania is now 23.
- Ken VK5QW advises that Peter KH6HBZ, who is now in Somalia (see Feb AR) is a surgeon attached to the US Marine Corps. He was to be in Somalia till the end of February. His QSL manager is K4YMQ Ira Franklin, 1316 Colonial Way, Alabaster, AL35007, USA.
- I like the rubber stamp on the front of N7MUX/DU4's reply envelope, which says "Contains no cash, cheques or anything of value".
- Brian C21BR returned to New Zealand on 19 February, much earlier than the anticipated date in April (see March AR).
- Ken has changed his V73CT callsign to V73C. His QSL manager is still AH9C.
- New regulations in the People's Republic of China have allowed some amateurs to operate from home. The distinctive prefixes of BA, BC and BG will designate such elevated and trusted status.
- The AH1A team had stopped transmitting on 4 February, but stayed on Howland Island until 10 February. High winds and high surf made boarding their ship, "Machias", extremely difficult and dangerous. They arrived back in Hawaii on 15 February.
- The ET3YU operator very proudly calls himself "pirate radio ET3YU" on his QSL card. He operates from Ethiopia, but it appears he is not licensed. Save your energy and money.
- Romeo 3W3RR has personally delivered the documentation for the P5RS7 activity to the DXCC desk of the ARRL. It appears the decision of accepting the North Korean activity will not be made before 30 March. The QSL cards for P5RS7 are being printed now. QSL manager: JA1HGY Nao Mashita, 8-2-4, Akasaka, Minato, Tokyo, Japan.
- The starting date of the ARRL 5BDXCC award has been changed to 15 November 1945.
- According to Steve Gregory VK3OT, QSL manager for XUOUN, not all stations operating under the United Nations Transitional Authority in Cambodia are licensed. I was shown a photocopy of a Cambodian licence on which I could recognise the callsign as XUOUN, and the words VHF, HF and WARC, and a reference number as JO489414G.
- TZ6RM will return from Mali to the US at the end of April.
- At the end of February, amateur radio stations in Kuwait had an NLD suffix attached to their full callsign, indicating the celebrations on the occasion of the National Liberation Day of Kuwait.
- Chatham Island ZL7AA and a number of individual ZL7 callsigns showed up on various bands as predicted, on the first day of March.

QSLs received

From managers: VK9LD (VK4CRR 1W) — VK0NE (VK9NS 4W) — CY0NSM (VE1CBK 12W) — HZ1TA (OE6EEG 10W) — XUOUN (VK30T 1W) — VI4RUM (VK4GAT 4W) — From bureau: VK8SEA (8W).

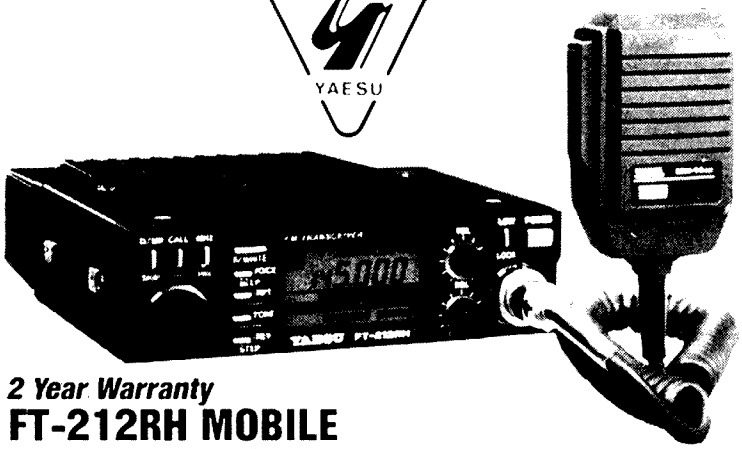
Thank you

This column would not have been possible without the input of the following contributors: VK2KFU, VK3DVT, VK3OT, VK4DA, VK4OH, VK4OD, VK5QW, VK6RO, VK9CB, DL6ZFG, HL9HH, ZL1ST, and the following publications: QRZ DX, the DX Bulletin, and the DX News Sheet.

Good DX and 73

* *PO Box 93, DURAL NSW 2158*
ar

GET IN TOUCH... WITH THE WORLD!



2 Year Warranty
FT-212RH MOBILE 2m FM TRANSCEIVER

The FT-212RH is a compact mobile FM transceiver that can also double as an easy-to-use base station. Provides 45-watt output over the 144-148MHz range, with a rugged diecast chassis for superb RF isolation and extensive use of surface-mount components for greater reliability. What's more, it has a large back-lit LCD with bargraph PO/S-meter, 5 selectable tuning steps and a total of 21 memories (18 general purpose, 1 call channel and 2 sub-band limit memories for band scanning). As well, there's inbuilt C.T.C.S.S encode and a variety of scanning functions. Complete with mobile mounting bracket, MH-14A8 hand microphone and DC power lead.

Cat D-3494

SAVE $70 **$499**

2 Year Warranty
FT-747GX COMPACT H.F TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts PEP output on all 1.8-30MHz amateur bands, and general-coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and an easy-to-read backlit digital display, dual operator-selectable tuning steps for each mode, dual VFO's for split-frequency operation, and 20 memory channels (eighteen of which can store split Tx/Rx frequencies). Wideband 6kHz AM and narrow 500Hz CW IF filters are also a standard feature. Complete with Yaesu MH-1 hand microphone.

Cat D-2930

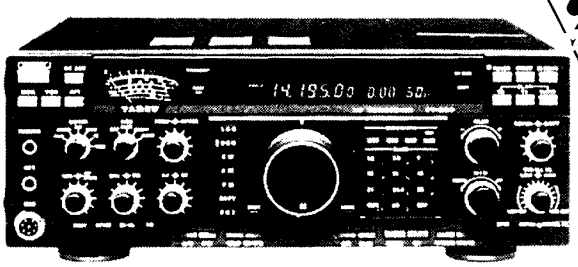
$1299

WITH ANTENNA BONUS!

Your choice of 2 'Mobile One' mobile HF antennas from our range of 80m, 40m, or 20m whips. ***Worth Over $90***

RMK-747 remote front-panel mounting kit for the FT-747GX is now available. Great for HF mobile operation where space for a full-size rig is limited. See ARA review volume 15 No 7.
Cat D-2931

(Includes installation on your FT-747GX) **$450**

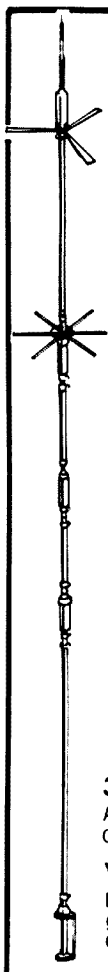


2 Year Warranty
FT-990 H.F ALL-MODE BASE TRANSCEIVER

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM) with the internal AC power supply allowing high duty cycle transmissions. An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 500Hz B/W CW filter, 90 memories and one-touch band selection. Microphone optional extra.

AC version FT-990 Cat D-3260 **$3495**

DC version FT-990 (upgradeable to AC version) Cat D-3255 **$3195**



RUGGED HF 5-BAND TRAP VERTICAL ANTENNA

HUSTLER

The tradition continues! The 5BTV is yet another masterpiece from the people who have been making antennas for over 33 years. This rugged 5 band HF trap vertical uses Hustler's exclusive trap design (25mm solid fibreglass formers, high-tolerance trap covers and low loss windings), for accurate trap resonance with 1kw(PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, less than 2:1 SWR at band edges), with 80kHz bandwidth typical on 80m at less then 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands.

High strength aluminium tubing and a 4mm (wall thickness) extra heavy-duty base section provides optimum mechanical stability. What's more, stainless steel clamps and hardware guarantee a longer life. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in on elevated position with a radial system. Unlike other antenna designs the 5BTV can be led with any length of 50 ohm coax cable.

Cat D-4920

$329

Made in USA

30m RESONATOR KIT

Adds 30m coverage and includes all hardware.

Cat D-4921

$89.95

VRK-1 RADIAL KIT

Provides a 5-band ground-plane for above ground antenna mounting positions.

Cat D-4922

$69.95

DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz and is easy to assemble and install. With extensive aluminium and stainless steel construction it's extremely durable, while allowing transmission on the 6m, 2m, 70cm and 23cm bands with a maximum power rating of 200W PEP. Complete with mast mounting hardware, stainless steel U-bolts and instructions.

Cat D-4840

$169

VHF/UHF BASE STATION ANTENNAS

We carry a wide selection of high quality vertically polarised base station antennas to suit most VHF/UHF Amateur applications. Each antenna was chosen based on its tested performance, reliability, construction quality and value for money, so you can be confident they'll work well the first time and last for years. Brands supported include Diamond and Brainer from Japan, as well as an excellent Australian made Mobile One product.

a) HIGH PERFORMANCE VHF/UHF BASE STATION ANTENNAS

These antennas from Diamond and Brainer are all of a stacked colinear type which provide high gain, wide bandwidth and a low radiation angle for extended range base station operation. Each antenna uses a jointed F.R.P (fibreglass reinforced polyester) outer tubing radome with gasket seals to ensure excellent all weather operation, and is supplied with compact ground-plane radials for a clean radiation pattern. Corrosion resistant stainless steel mounting hardware is also supplied. Brainer antennas are exclusive to Dick Smith Electronics and feature detailed locally written instruction sheets. Both brands are covered by a 1 year warranty.

2m ANTENNA F-23A

Frequency:	144-148MHz
Gain:	7.8dB
Max Power:	200W
Length:	4.53m
Type:	3 x 5/8 λ colinear
Connector:	SO-239

Cat D-4850

DIAMOND ANTENNA

$239

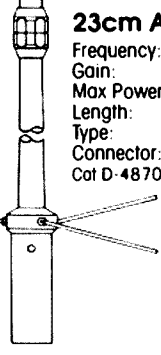
2m/70cm ANTENNA GST-1

Frequency:	144-148MHz, 430-440MHz
Gain:	6.0dB(2m), 8.0dB (70cm)
Max Pwr:	200W
Length:	2.6m
Type:	2 x 5/8 λ colinear (2m), 4 x 5/8 λ colinear (70cm)

Cat D-4830

BRAINER

$199



23cm ANTENNA F-1230A

Frequency:	1260-1300MHz
Gain:	13.5dBi
Max Power:	100W
Length:	3.06m
Type:	25 x 1/2 λ colinear
Connector:	N-type

Cat D-4870

$299

2m/70cm ANTENNA GST-3

Frequency:	144-148MHz, 430-440MHz
Gain:	7.9dB (2m), 11.7dB (70cm)
Max Power:	200W
Length:	4.4m
Type:	3 x 5/8 λ colinear (2m), 7 x 5/8 λ colinear (70cm)
Connector:	SO-239

Cat D-4835

BRAINER

$279

b) ECONOMY 2m BASE STATION ANTENNA

An outstanding value-for-money, compact ½ wave Australian-mode 2m base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection.

Cat D-4820

5 Year Warranty

$49.95

MOBILE ONE

DS XPRESS PHONE & MAILORDER SERVICE
Outside Sydney (FREE Call) 008 22 6610 Sydney And Enquiries - (02) 888 2105
FAX: (02) 805 1986 or write to DS XPRESS, PO BOX 321 N/RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.

DICK SMITH ELECTRONICS

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 8833 • Hurstville 580 8822 • Kotara 58 2062 • Liverpool 600 9888 • Maitland 33 7888 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney (Greenwood Plaza) 964 9467 • Orange 818 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 **ACT** • Belconnen (06) 253 1785 • Fyshwick 280 4944 **VIC** • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2388 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 328 8088 & 246 Bourke St 639 0398 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0522 **QLD** • Booval 282 8200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 8255 • Maroochydore 791 800 • Rockhampton 27 9844 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 • **SA** • Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 8099 • Enfield 260 8088 • St. Marys 277 8977 **WA** • Cannington 451 8888 • Fremantle 335 9733 • Perth City 481 3281 • Midland 250 1460 • Northbridge 328 8944 **TAS** • Hobart 31 0800 • Launceston 344 555 **NT** • Darwin 81 1977
STORES ACROSS AUSTRALIA AND NEW ZEALAND

Divisional Notes

Forward Bias — News from the VK1 Division

Christopher Davis VK1DO

At our annual general meeting in February, the following members were elected to office:

President — Christopher VK1DO, Treasurer — Don VK1DH, Secretary — Hugh VK1YYZ, Senior Vice President — Rob VK1KRA, Junior Vice President — Dick VK1KRE.

Committee members elected were : Paul VK1BX, Rob VK1KRM, Keith VK1ZGW, Ian VK1BG, Michael VK2ZGU.

Our April meeting will be held on Monday 26th April 1993, commencing at 8.00pm in the studio room of the Griffin Centre Canberra City. Our guest speaker will be Wing Commander Keith McPherson, the Project Manager Space and Joint System Headquarters ADF. His technical presentation will be on Global Positioning Systems, better known as GPS. These state of the art devices combine many of the technologies pertaining to our hobby, namely low earth orbit satellites, and microprocessor technology.

As well as the presentation of GPS systems at our April meeting, we would like our members to participate in a survey to determine preferences for broadcast times, and the provisions of other member services.

Members please take note of the dates for the remaining 1993 meetings. Each meeting is held on the fourth Monday of each month:- 17th May, 28th June, 26th July, 23rd August, 27th September, 25th October, 22nd November.

VK2 Notes

Tim Mills VK2ZTM

Annual General Meeting

Members of the WIA NSW Division are advised that the 1992/93 AGM will be held at Amateur Radio House, 109 Wigram Street, Parramatta on Sunday 9 May 1993 at 2pm. The business paper, annual reports, membership cards, QSL Bureau registration and other material for this meeting are an insert to this issue of Amateur Radio.

Bob Lloyd-Jones VK2YEL, Secretary

The AGM is being held a week later than previously intended due to a clash with the Federal AGM. Proxies for the meeting have to be lodged at the office by 10am on the day of the meeting. There are some changes being introduced in the VK2 QSL Bureau. Notice has been given already via the VK2WI broadcasts. All intending to collect cards via the Bureau have to keep a current notification with the Division. A card may be with the annual report to enable you to update this information. A report in later VK2 notes.

The next exam conducted by the Division will be at Parramatta on Sunday 23 May. Applications close 6 May. Contact the office. The next Trash and Treasure is on Sunday 30 May. The annual Urunga Convention — naturally at Urunga on the VK2 north coast — over Easter. The Parramatta office has no more 1993 callbooks. *(Publisher's Note: The WIA Federal Office has a limited supply of 1993 Call Books still available.)*

Pagers/repeaters

Other call areas with more gentle terrain may not have the concentration of paging transmitters needed in parts of VK2. Much of the published material to date seems to infer that the amateur has to live with and take whatever action is practical to cleanse one's receiver of pager "noises'. An area that is not being addressed in the discussion to date is the ability of some pairs of pager systems to preform — somewhere — a 2a-b mix of their fundamental frequencies, and one of the resulting mixes is appearing near 147-148MHz repeater inputs. Some of these signals originate tens of kilometres from the site of the repeater being affected.

Often the offending pager site/s can be easily identified, and retuning or other action at the site with the equipment often reduces or eliminates the mix. However, these sometimes recur or other systems/sites get into the act. Systems affected at the moment include VK2RGL Bulahdelah 7375; VK2RTS Springwood 7300 and VK2RIL Wollongong 7275. NTAC is currently reviewing the matter and welcomes any written material to the VK2 office via the contact methods detailed in AR's page 3 directory.

Matters before the NTAC committee at the moment include the pager problem noted above, and ATV channel allocations. Applications received recently for changes or new systems include several additional systems from six metres and up for the Goulburn ARS. Tamworth wishes to relocate its VK2RMO on Ch 7275 from near Tamworth to Narrabri. The North Shore RC seeks to establish a 70cm repeater in Sydney. The Newcastle UHF and ATV club wishes to change channel on its ATV repeater VK2RTN, now a Ch 35 has become operational in Newcastle. They seek a 1250MHz FM input, and a 444.25MHz VSB output. Site remains at New Lambton.

Groups in VK2 seeking changes or new systems are reminded that the procedure is outlined on page 27 of the 1993 Australian Callbook. To assist with processing you should first obtain a set of the paperwork from the office. Applications/changes are processed by NTAC and passed to Divisional Council for their action and forwarding to the State DoTC office.

VK2WI

A frequency change has been performed on the 2m SSB broadcast transmitter; it is now on 144.150MHz. Some work is being done by way of additional antennas to allow some of the VK2RSY beacons to remain on for most of the broadcast period. Up till now the beacons and SSB transmitters have shared common antennas. In the long term, both services will have new and relocated antennas further from the ground to see over the continued tree growth.

VI150SYD

Stephen Pall VK2PS, WIA NSW Division, Special Projects Officer

Statistics of the special event station VI150SYD activity 1 January 1992-31 December 1992. This list of clubs and individuals is not in any particular order.

Name of club, callsign of participating operators — if known — and number of contacts made.

VK2 New Members

The following are recent new members in the VK2 Division. Our usual warm welcome to them.

GR	(Robert)	Barker	VK2TSR	Greystanes
P	(Prabhakar)	Bhat	Assoc	Toongabbie
J		Brand	VK2NQ	Strathfield
CL		Cronin	VK2CLC	Kogarah
KJ	(Kenneth)	Draper	VK2VVV	The Entrance
C	(Craig)	Flanagan	Assoc	Newcastle
BS		Furby	VK2XNZ	Campsie
DJ	(David)	Gardiner	VK2KDG	North Nowra
JJ	(John)	Gerhard	VK2TH	Wagga Wagga
FW	(Frank)	Gross	Assoc	Nowra
BH	(Brian)	Halpin	VK2BVH	Miranda
GM	(Greg)	Hammond	VK2YKI	Lindfield
KM		Hawkins	VK2GXB	Tumbi Umbi
GA	(Gerard)	Hill	VK2DAA	Castle Hill
A	(Adrian)	Johnston	VK2TBG	Forestville
P	(Patrick)	Johnston	Assoc	Kellyville
DJ	(Darryl)	Jones	VK2YDJ	Lemon Tree Passage
SW	(Shaughan)	Linton	VK2DSL	Ballina
DJ		Martin	Assoc	Toongabbie
D	(Dennis)	Phillips	VK2GWA	Winmalee
GC	(Glen)	Prout	VK2KIS	Marsfield
K	(Kruno)	Ratkovic	Assoc	East Nowra
G	(Ganeshwaran)	Rajoyogam	VK2MMH	Homebush
GG	(Geeta)	Rajoyogam	VK2GVI	Homebush
S	(Steve)	Reeves	VK2CT	Mt Pleasant
D	(Donald)	Smith	VK2BDU	Deniliquin
C	(Con)	Socuuoc	VK2AAU	Sylvania
NS	(Norman)	Steele	VK2NSS	Granville
VN	(Victor)	Stafford	VK2XOI	Copacabana
G	(George)	Tanos	Assoc	North Rocks
R	(Raymond)	Tooby	Assoc	Hornsby
TF	(Thomas)	Vandermeel	Assoc	Oakhurst
FA	(Francis)	Wright)	VK2FUU	Ryde

Eight amateur clubs/groups participated:

1. Gladesville Amateur Radio Club Inc, Amateur Television, VK2TVG, several operators, 16 reports.
2. Liverpool and District Amateur Radio Club, VK2AZD, VK2SE, 21 contacts.
3. WIA NSW Division "Picnic in the Park" 60 years of ABC, VK2GNT, VK2CAM, VK2AXT, 10 contacts.
4. WIA — NSW Division, broadcast and callbacks, VK2WI, VK2AGH Lismore, VK2ETK Orange, 197 contacts.
5. Clan Macleod/James Craig. Iron barque undergoing restoration in Sydney Maritime Museum, Darling Harbour. VK2CAM, VK2GNT, VK2AXT, 72 contacts.
6. Hornsby and District ARC. VK2DEJ, VK2EYC, VK2DJW, VK2FKP, VK2MJ, VK2CNI, VK2JGV, VK2PEJ, VK2MA. Total contacts 531.
7. Royal Naval Amateur Radio Society, VK2 Chapter. VK2TJ, VK2CWS, VK2FYM, VK2CNI, VK2CC, 165 contacts.
8. Australian National Amateur Radio Teleprinter Society. VK2BQS, VK2JPA, VK2TTY. Approximately 22 contacts.

Ten individual amateurs have taken part in the VI150SYD activity. Callsigns and number of contacts, not in any particular order: VK2DT (35), VK2TZ (429), VK2BEX (595), VK2RV (500), VK2CSZ (78), VK2LEE (290), VK2KAA (207), VK2SKY (525), VK2ZSC (14) and VK2PS (2669).

The number of DXCC countries worked is over 160. Total number of contacts: 6257.

Transmission modes used: SSB, CW, RTTY, Packet, FM, ATV. Twelve amateur bands used, from 1.8 MHz to 450 MHz.

5/8 Wave

Rowland Bruce VK5OU

A month gone by and I'm back into things again, and it was great to hear of all that had being going on whilst I was away. In particular, the co-opting of three new Council members and their accepting various positions, has relieved the pressure on others considerably.

The men in question are:- Maurie Hooper, VK5EA, as Secretary, Membership Secretary and Journal Editor, Garry Herden, VK5ZK, as Minutes Secretary, FTAC Representative and SAPUG Representative, and Don Wilton, VK5KDW, Examination Officer. Thanks Guys!

Even when I'm back in town well laid plans can go awry. It appears that I missed an excellent talk by Garry at the February General Meeting. One of these days I SHALL get to a talk that will stir me into Packet. One of these days!

Considerable work seems to have been done on preparing proposed changes to the Constitution. Details were published in the February edition of the Journal. If you missed them I'm sure Maurie would be able to drag up a copy for you (SSAE?), and don't forget to come along to the AGM this month to vote on them and to elect your new Council.

Of course, you cannot win them all. No sooner does one position get filled than another occurs. This time it is the QSL Bureau. Alan, VK5ZN, is moving to sunnier climes. (Today was PERFECT in Adelaide All) We shall all miss him, and Miwa at the BBG dispensing the cards, and chastising those who made life difficult for him. Perhaps you'll get the Q job? Thank you both for an excellently done job. And thank you Alan for arranging a successor. John Vaiciulis, VK5FOX, has taken over. John is an avid DX-er, and I recall from my own days as bureau manager that he was an almost perfect QSL-er. (The card size just a little big, eh? Let's see what you do with them, John.) The address remains the same — Box 10092, Gouger Street,Adelaide 5000, not the familiar GPO Box 1234, Adelaide 5000 that the normal WIA mail goes to. As far as I know the system is unchanged too, at least for the moment.

It's always good to hear of new members, and there has been quite a swag of them lately.

Welcome to the WIA SA Division to

Wally Butler	VK5MAB
David Giles	VK5JAA
Trevor Harding	VK5ZLM
Jeff Hollitt	VK5JK
Rod Kopp	VK5SX
Lew Schaumloffel	VK5AKQ
Danny Stefanac	VK5NSD
John Sutherland	
Michi Uchida	VK5KCW
B Warner	VK5KBW
Grant Willis	VK5ZWI
A Rechner	VK5EK

Also, from the Territory, we welcome Gordon Hemming VK8ZZ, and Mark Phillips VK8MA.

It was good to hear at the recent Council meeting that the number of members had not decreased in January as much as in previous years. Let's hope the positive trend continues once the mad New Year rush for renewals has passed its peak.

On the WICEN front there is a flurry of activity ahead. Volunteer operators are appearing for the Walk Against Want, (probably over by the time you read this,) and the SA Great Bike Ride in May.

The National Parks and Wild Life exercise has been deferred to next year, but the NPWS is still looking for operators. Ian Watson, VK5KIA, is the Co-ordinator to talk to if you are interested in WICEN.

Notes from VK6

December 1992 General Meeting and Presentation Night

The Divisional Council decided that it was again time to recognize the untiring efforts of some members in providing the Weekly News Broadcast, and all its relays every Sunday, and the Morse Practice sessions almost every night, on either Hf or VHF.

Eleven of the thirty one recipients were able to be present to have their plaques presented by the President Cliff VK6LZ.

Mai, VK6LC who was the previous Morse co-ordinator, and had designed and constructed the units used by the Morse team, accepted an award on behalf of the absentees.

If you can give a couple of hours, twice a week or month, you can become part of the Morse team. Phil VK6SO would very much like to hear from you.

State News Broadcast Team

Harry Atkinson	VK6WZ
Nick Morgan	VK6ND
Glen Thurston	VK6ZGT
Cyril Eakins	VK6CN
Bruce Williams	VK6CX
Don Reimann	VK6DY
Ted Davies	VK6ED
Chris Carter	VK6FC
Don Graham	VK6HK
John Tower	VK6IM
Dave Couch	VK6WT
Aubrey Keightley	VK6XY
Reg Evans	VK6YE
Nth Corridor Radio Group	VK6ANC
Tom Deans	VK6BDT
Bob Blinco	VK6KRC
Phil Jamieson	VK6ZPP

State Morse Practice Team 1992

Phil Bussanich	VK6SO Co-ordinator
Barry Butler	VK6AF
Mark Bussanich	VK6AR
Dianne Cousins	VK6BC
Ken Hammond	VK6KN
Rob Walter	VK6RG
Martin Suter	VK6SA
Joe Anderson	VK6ALJ
Neil Basden	VK6ANB
Bill Jones	VK6BIL
Rod Harrod	VK6BRH
Max Schimpf	VK6MAX
Charlie Bird	VK6NCB
John Bearsby	VK6YBP

State News Relay and State Morse Practice Team

Emmanuel Zimmerman VK6NEB ar

The recipients of their awards are:-

Standing Left to Right; VK6ZGT, VK6HK, VK6LC (now also VK8LC), VK6AF, VK6SO, VK6RG, VK6YBP

Kneeling ; VK6AR (ex VK6AMB), VK6NEB, VK6ANB, VK6CX.

VHF/UHF An Expanding World

Eric Jamieson VK5LP

All times are UTC

Six metres

Despite a general falling off in Es activity, let no one say that six metres is dead, far from it, as shown by this generalised report from Steve VK3OT, who is not available to operate on the band every day! Scattered amongst the JAs are a few very good contacts to other areas, so it will pay to be vigilant, especially during April.

31/12/92: ZL4TBN, VK3MC. 1/1/93: 0004 to 0035 VK2XIC, ZL2UJH, VK3DUQ, ZL3MHF/b, VK4ABP, ZL2QS, ZL2TPY, ZL1ANJ; 0300 to 0535 VK2ZHE, VK2EFA, JA7ZMA/b, JH7BKN. 2/1: 0200 to 0230 VK2JSR, VK4ABP, VK4ANP. 4/1: 2205 ZL1ANJ, 2230 VK4ZAZ. 7/1: 0800 VK8AH, ZL3MHF/b. 8/1: 0100 to 0120 VK6RPH/b, VK6KZ, VK6ZPP; 0313 to 0745 VK6RPH/b, VK6ZPP, JH1WHS, JH4MGU, JA7ZMA/b, VK4BRG/b, JH0HZO, JE2DWZ, BZ4SBX, P29JA. 10/1: 0513 to 0741 KH6IAA, AH6LR, VK4BRG/b, VK1RX. 17/1: 0143 to 0305 AH6LR, KH6HI, KH6HME, AH6JF, JA7WSZ, VK4BRG/b, JA7ZMA/b, JH0HZO. 20/1: 0730 to 0749 JA2BZY, JR1ZIY, JA7ZMA/b, JA2IGY/b, JH1WHS, JE1BMJ. 25/1: VK4BRG/b. 26/1: 0325 to 0945 VK4BRG/b, JA6QGG, JA7ZMA/b, JA2IGY/b, JH1WHS, JA5CMO, JA7WSZ, JA4QHO, VK4ABW, VK8VF/b, VK8RH, VK4ABP 27/1: 0100 to 0130 VK4BRG/b, JA7ZMA/b, VK4ABP/b.

7/2: 0418 to 0435 JA8TSG, VK4ABP/b, VK4BRG/b, JA8GSZ, JH8ZND. 18/2: 0200 to 1345 JH1WHS, JA7ZMA/b, JA2IGY/b, VK4ABP/b, JH4JPO, JE2DWZ, JJ1CKD, JH3APG, JA2DDN, JA6YBR/b, JE6OKI, VK4EJR, JA4GYM, JI2UNR, JF2JFD, JA5CMO, JJ1WKX, JR2HCB, JJ1NLR, JI2EVL, JJ6LPG, JA7OQ, JA9IPF, JA1CWN, JA5FDJ, HL9UH, KC6RR, P29PL, BV2DP, JA3,5 and 6 to 1345.

On 23/2 Andrew **VK8AH** scored a good catch when around 1300 he worked XU5DX and XU0UN from Cambodia and these are believed to be the first six metre contacts between VK and XU. Here is further proof that no one can safely declare that six metres and/or Cycle 22 is finished. It seems that whenever there is a good opening to JA, then one should be delving around for that rare contact, although sometimes good contacts can be made on what appears to be a dead band.

John VK4TL from Malanda, North Queensland, in a letter upgrading his Six Metres Standings List, said the first TEP for the year appeared on 17/2 with three JA QSOs between 0941 and 1049. Also propagation to VK3 and VK5. On 18/2 open early to VK3 and VK5, then 44 JAs on a beam heading of 315° for maximum signals which is 45° from normal direction. On the same beam heading John also worked KC6RR, HL9UH and BV2DP.

John queries whether anyone has worked VR6JJ on Pitcairn Island as he heard a southern station in contact with a foreign sounding station on 50.120 with a beam heading of 105° around midday local. No date supplied.

David VK2BA also updates his list and says that in the March to June period of 1992 he heard or was heard by JT1, UZO, HKO, C6 and ZK3 and missed them all. He says the Sydney area is disadvantaged by much white noise from the new ABC Ch 2 transmitter, which radiates a strong spurious on 50.700 MHz with birdies up and down the band, some close to 50.090, 50.105 and 50.120. David concludes by saying *I guess that things are not as bad as they were with Channel O on the air!*

It is of interest to note that although VK5 does not have a Channel O transmitter, on many occasions throughout the year and much more so during the summer Es period, the Channel O station in Toowoomba is so strong in this State (and probably Victoria) that massive amounts of krud blanket large sections of 50 MHz, wiping out weak signals and forming a nasty background to the stronger stations, those mostly from VK2 and VK4. Fortunately, to a large extent, the problem is alleviated when the antenna is turned away from VK4, especially when looking towards VK6.

It was good to receive a letter from **Col VK7LZ** who first came on the air in 1933. He has had a long time interest in six metres and said that from 24/11 to 24/12/92 he worked VK2, VK3 and VK4, plus JA2, JA7, JA8, ZL3TY, ZL3AAU, ZL4TBN/3. On 19/12 he was pleased to work NI6E/KH6 and on 24/12 a contact with VK8RH in Darwin, a rather rare contact in Launceston! Col said there were many more VKs to work but he was looking for stations from other countries.

Early days on six metres

Lance **VK4ZAZ** recently wrote an interesting letter which included reference to the 1950s so here is some of it. Lance writes *"I was in Mount Morgan when I first came on the air, initially on five metres, then moving to six when we got clearance for work with the IGY. This activity probably got limited licensees on to six metres. The authorities at the time probably did not know that we were about to demonstrate that six was an International Band. I actually had a five metre DX contact via Es to Jack, VK2ADT at Inverell.*

As an example of the work needed in earlier days, I hold WAS Certificate No. 26 issued on 19/1/62 and endorsed for JA, W, ZL, VK9 Papua, VK9 Territory of New Guinea and KR6. I entered the six metre arena in October 1957 and this result was consistent with that of others of the era, with all contacts on AM. By comparison, during the recent Cycle 22, on several occasions I worked up to seven new countries in a single day — more than I had been able to do in those first five years of my operating."

Lance also included a couple of pages of early contacts, accompanied by appropriate comments. I have selected a number for readers interest.

25/10/57 1039 JA3GI — six metre permit just arrived. JAs copied previously but this my first JA contact. 30/10/57 1030 VK2WH — Hugo was my first six metre interstate contact. 16/2/58 2230 43.8 MHz Twin Cities paging service (US), first of many such paging services received, including some South American services. Same day worked JA2OW who queried the legality of my call sign. He thought it was too far down the alphabet so soon for a VK4 — very tortuous to convey what a Z call was to a Japanese! 2/3/58 0958 JA9DC — achieved AJD with this contact. In later years AJD was achieved in one day on many occasions. Also worked mobile in 1989. 10/3/58 0944 KH6NS — Ed is still around on six metres.

16/3/58 0137 W0CNM, W7SPO, K6ERG, W6WWD, K6PXT and others worked through heavy JA QRM. Some Ws using converted SCR522s. K6PXT still a regular on six metres. 19/4/58 am — good backscatter to north east. Stations included VK9NT (TNG), VK9XK (now VK4XA) Moresby, VK4XJ Bundaberg, VK4HD Buderim and ZL1DE. Stations all had crystal frequencies, which by gentlemens' agreement, were sufficiently apart. 20/4/58 2210 CE8AE the IGY beacon received at good strength. Apparently no other activity from that location. The path was interesting in that it does not cross the geo-magnetic equator — F2.

23/6/58 0830 — inband video signals. This may have been the first time I received BBC TV, confirmed later. 30/10/58 0845 JA2AQ — first mobile QSO to JA, 5x9. I used 4 watts to a 2E26 and whip antenna. 8/2/59 0920 BBC1 and 2 approximately 48.250 and 50.250. Test pattern and music. BBC was AM sound at that time. Reception confirmed by Engineering Branch who strongly advised Australia to stay out of Band 1 for TV. This letter was sent to Planning Section, Radio Branch, with lack of success.

5/4/59 1205 KR6AK — Okinawa was a separate country then. VS6CJ was also heard under S9+ JAs. First logging of US scatter link across the Pacific and range of frequencies around 49 MHz and upwards to about 49.6 or so. 20/11/59 0930 BBC TV again. Note time and dates — six metre contacts into Europe are made around this time. Pity no one there had permits. An EI got a spot frequency, but as far as I know, only worked US and down to the Mediterranean and perhaps South Africa.

WIA News

Cheats Don't Prosper

A Queensland amateur has had his certificate of proficiency and station licence cancelled by the Department of Transport and Communications (DOTC).

The action follows investigations into irregularities in the conduct of examinations in one district in Queensland.

The WIA Exam Service has suspended a number of accredited examiners recently. DOTC investigations are still continuing. We will advise the outcome when more information comes to hand.

It is understood from general discussions with DOTC that incidences of cheating under the WIA-administered examination system are very much less than that under the previous system.

22/4/60 1205 KA7AX Americans working out of Japan; KA2FW was another regular. 15/9/60 — JA station number 1000 worked. 22/3/69 1320 KG6/K7HIX Guam. US Navy airman. Ken set up lunch time skeds which worked from a dead band at times. 4/6/69 1307 HL9WI Bill on AM/SSB.

I am sure that Lance could write a fascinating story in relation to early six metres. Incidentally, as much of his work entailed travelling in a car, he made many contacts to out of the way places using his six metre mobile equipment. He notes that his six metre mobile record is not much short of the VK4 short path record. It was to FM5WD who was 5x9 and gave a return report of 5x8, with Lance using about 40 watts and a 1/4 wave whip.

From Europe

Ted Collins **G4UPS** reports that the Republic of Czechoslavakia no longer exists and from 1 January 1993 it was replaced by the Czech Republic and the Republic of Slovakia.

The Czech Republic has continued to use the OK1 and OK2 prefixes plus OL prefixes, and Slovakia has replaced the OK3 prefix with OM3, while it waits for a completely new callsign allocation from the ITU.

Ted also reports a general release of the six metre band to Class A amateurs in **Poland** from 15 January 1993, with a ten watt power limit and no antenna restrictions. However, to gain the six metre extension to their licence the amateurs are required to pay the equivalent of one month's salary! (That kind of requirement would make VKs snort!...5LP).

The January band report from Ted indicates a considerable reduction in general contacts except for 16/1 when from 0858 to 2130 he was kept busy with DJ6, DL7, EH3, EH5, EH6, EH7, ES5, F2, G3, I2, I3, I4, IK2, IS0, LA9, OE2, OK1, OM3, OZ1, OZ3, OZ4, OZ6/b, OZ7/b, S51, S55/b, S57, S59, SM0, SM6, SM7, YU2. That's fourteen countries in 11½ hours of Esl

Geoff GJ4ICD from Jersey Island has confirmed the position regarding Czechoslavakia and Poland. Also, despite information to the contrary, Swiss stations have gained an extension for the use of 50 MHz but not on a 24 hour basis as reported — all operating is outside TV hours. The Vatican City now joins the ranks of 50 MHz countries with HV4NAC. This is a new country for both RSGB and ARRL. Geoff also reports that within Europe there are more than 20 countries still active on Band 1 TV ie 48.250 to 49.750 MHz.

Countries first worked on six metres from Australia

Add new entry: XU5DX Cambodia 23/02/93 VK8AH; HL9WI change from VK8GB to VK4ZAZ 04/09/69; change KG6DX to KG6/K7HIX worked by VK4ZAZ 22/03/69; change KH0/JJ1AEB to KH0AC worked by VK4ZAZ 07/04/89; V31PC change from VK4ZJB to VK4ZAZ 19/04/89; change VK9BW to VK9NT worked by VK4ZAZ 01/06/58; ZK1WZ change from VK4ZJB to VK4ZAZ 28/03/89.

I have already commenced the state by state break-down of prefixes worked in Cycle 22 and this will be ready for your perusal in due course. Since 1 January 1984 has anyone worked the following: 5Z4 Kenya, 9N1 Nepal, CR9 Macao (XX9 since 1985), VK9 Christmas Island, VP2 British Virgin Islands, VU2 India, ZD7 St Helena Island and ZD8 Ascension Island? If so, could you please advise me your callsign, the callsign worked, country, date and time. All were worked prior to 1 January 1984, but I am not sure if any have been worked since that date.

VHF/UHF Field Day

Doug VK4OE phoned to say he operated from Siding Springs during the Field Day on 16-17/1, from where he had contacts to Sydney and Canberra on 144 and 432 MHz. Chris VK1DO was on Mt Ginini and Eddie VK1VP in Canberra. Also worked was VK2DVZ at Taree. On 23 cm he worked VK4KZR/4 who was on Mount Mowbullan, an all land distance of 570 km.

The Geelong Amateur Radio Club newsletter said their team set up a field day station on Blue Mountain, arriving on 15/1 in hot weather, followed by rain at night, then a fine morning on 16/1. The 24 hour competition commenced at the same time as the rain bucketed down for five hours, requiring a good sized camp fire to dry rain soaked articles.

The GARC team worked consistently during the 24 hours and accumulated in excess of ten thousand points, aided by a JA opening on six metres. They also scored good points for 70 cm contacts to VK1 and VK5. The club is planning a further trip, this time for the John Moyle Field Day on the weekend of 20/21 March.

Two metres and above

On the basis of reports received there has been the usual activity on the bands up to 1296 MHz but nothing of outstanding importance.

However, a letter arrived last year from Chris G3WOS in response to my query regarding what was being done in the UK and Europe to promote long distance contacts on the bands 144 MHz and above. At the time I could not use the information due to pressure of space, but you may be interested in the following as it applies to the above areas.

Chris says *"I suppose the ultimate challenge to a 2m buff is to complete a transatlantic QSO. The distance from most any part of western Ireland to eastern Newfoundland is a little over 3000 km so the QRB is not the problem. Distances of that magnitude, and more, have been achieved on tropo occasionally and by sporadic E more frequently. For example, 24 of the top 100 stations in the German "Dubas Magazine's Top List" on 144 MHz claim ODX 3000 km, eg HG0HO 3865, DL7UME 3624 and DL7AKA 3620 km, via Es. From GW, GD and GI there is a good 3000 km sea-duct tropo path to EA8 at certain times of the year — and on 70 cm too.*

Many seem to think the Atlantic will be spanned by double-hop Es, but I reckon that's a tall order. First of all, Es at these latitudes is less frequent than it is in the Mediterranean region, where double-hop Es from Portugal to Israel occurs in summer — getting on for 4000 km. Second, the likelihood of two Es reflecting regions in the right places seems pretty remote to me. No, I figure the most likely mode will be by tropo. Most every year there are one or two days when a long sea duct exists across The Pond, as we call it. So far though, when the signals have got to within 100-200 km of land they have encountered a rotten weather front which has effectively blocked any further progress.

What we need is for EIs and VEs to keep a constant watch on the North Atlantic weather situation and set up keyers every time conditions look promising. The problem is there aren't any motivated EIs on VHF in the remote western regions of Ireland, and precious few in Newfoundland either.

From the Mediterranean, TEP type contacts have been made to ZS3 from Italy and Greece on both 144 and 430 MHz. Those are very long distances and the mechanism has been known for decades. The signals have a characteristic watery sound. In the UK we are too far north of the geomagnetic equator to get in on this act, though it might just be possible for GJ4ICD to do it, one day, given the right conditions and a following wind!"

Closure

There is little else to report. The weather patterns across southern Australia have been unreliable and seemingly incapable of any sustained activity on 144 MHz and above.

Closing with two thoughts for the month:

1. Finance is the art of passing currency from hand to hand until it finally disappears, and
2. An adult may see human wisdom manifested in its highest form by watching a child's boundless capacity for ignoring celebrities.

73 from The Voice by the Lake.

* *PO Box 169 Meningie South Australia 5264*
ar

Repeater Link

*Will McGhie VK6UU **

Will Scott VK4XP follows his simple link controller with a simple ident unit.

Simple Ident Unit for Repeaters

This ident unit suits any repeater or beacon as an automatic morse identifier. It can also be connected directly to the simple repeater link controller described in a previous article.

This unit is designed to send out the ident every ten minutes. Also to stop the ident being sent over another station's conversation, it is only sent on loss of carrier, not on commencement of carrier, as found on most ident units.

The unit is made from low power CMOS chips and can readily be set up on a solar powered repeater as the current drain is very low.

The Circuit

Shown is the circuit for the ident unit. It is made on veroboard and requires no special construction techniques or methods. The usual CMOS precautions are of course necessary when handling the chips out of the veroboard.

IC1a is part of a 556 timer chip, which contains two 555 timers. It is the clock and sets up the speed of the ident. With the components shown, it runs at about 18 Hz. To vary the speed, adjust C1, a 4.7 μF capacitor. The larger the capacitor, the slower the ident speed.

IC1a clocks a 4040 binary counter IC2. The counter counts upwards on each clock pulse. It is reset to zero when not sending the ident by a high on pin 11.

IC3 is connected to the 4040's output lines. It is a commonly available 2764 EPROM. The 2764 has a very large capacity which is largely unused in this project. It is used in the circuit because it is readily available and is more economical than other EPROMS with a lower capacity.

The 4040 drives the address lines of the EPROM, while only three of the data lines are used. The three lines are D0, D1 and D2. D0 is the actual morse ON/OFF signal, D1 is used to key the transmitter Press to Talk (PTT) and D2 is used to reset the ident unit back to the beginning after the ident has finished.

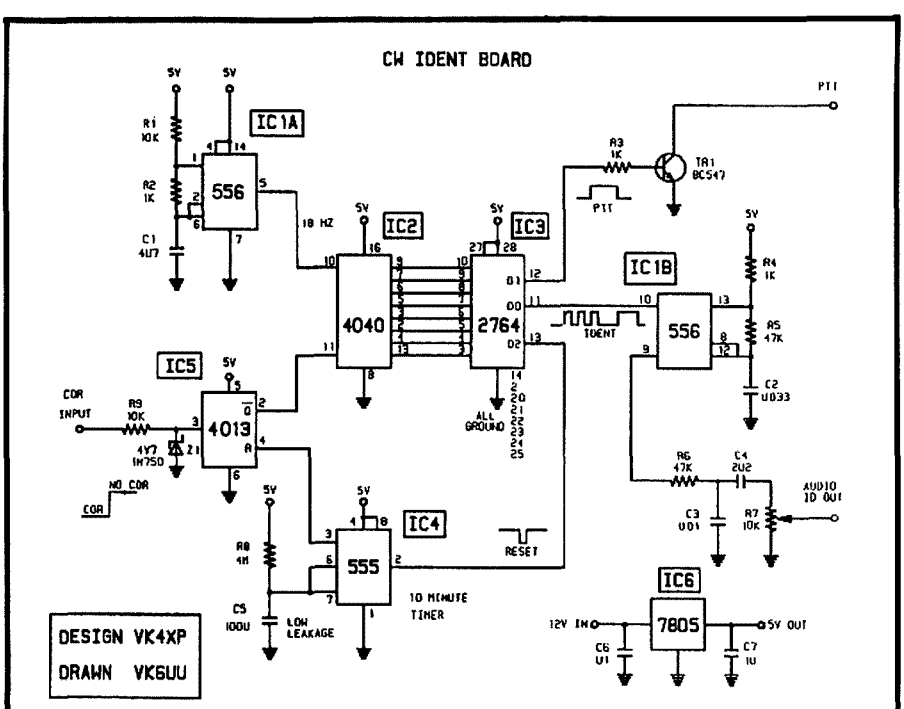
D0 is connected to IC1b, the other half of the 556 timer. This timer is configured as an audio oscillator which is turned ON and OFF by the EPROM. The square wave output from the 556 is smoothed by an RC network R6, C3 and C4 before being set to the correct level with R7 and being passed to the transmitter microphone.

D1 is used to hold the PTT line down while the ident is being sent out. It is fed to TR1, which acts as a buffer for the transmitter relay when wired direct to a radio transmitter.

D2 is the reset line. It is fed to another 555 timer. IC4. This IC sets the time between idents and is adjusted by C5, typically 100 μF.

IC5a is a 4013, a dual D type flip flop. It is the chip which is used to memorize that the ident is ready to go 10 minutes after the last ident was sent. Once set by IC4, it waits until a carrier appears then disappears before giving the OK for the 4040 to start counting. This allows a station to put in a call on a repeater without being accompanied by the morse ident.

The power supply is 12VDC which in turn is regulated down to 5VDC to run the ident unit by the 7805 chip.



Programming

The EPROM must be programmed with the individual sounds and spaces between the sounds of the ident signal. For example, the letter "v" consists of a unit of sound (a dit), a unit of no sound, a second unit of sound (a dit), a second unit of no sound, another unit of sound (a dit), another unit of no sound and finally three units of sound (a dah).

Only data bits D0, D1 and D2 are programmed, the rest are unused.

The table shows a typical program listing for a repeater. Note that there are firstly a couple of no sounds to commence with. These allow a slight pause before the ident commences. Then the ident itself runs out with another pause at the end of the ident. Finally a reset occurs by line D2 going low.

The program can easily be entered by hand using any EPROM programmer. As well, very long messages can be programmed into the ident unit if required.

Connecting to the Link Controller

The ident unit was designed to connect to the simple link controller, described in January 93 AR. For this to occur, R7 is not required as the audio level is set up on the controller board with another potentiometer.

The COR (Carrier Operated Relay) sense line and the PTT (Push To Talk) line are connected together as a single line that can be used for both PTT and COR sensing.

Because the unit runs off 5VDC a zener Z1 and resistor R9 is used as a level converter for the difference in input voltage levels. They may be replaced by a tie up resistor to 5VDC when being used with a 5VDC controller or CO relay.

Beacon Ident

The unit may be used as a beacon by removing IC5, the 4013 and linking pin 4 to pin 2. The ident will then cycle regularly. The time between indents will still be controlled by C5, the 100 μF on pin 6 of IC4.

This unit was originally constructed for VK4RMV, the Miriam Vale linked repeater on 7625. It has proven very reliable with not a problem since it was built and installed several years ago.

Program for VK4RMV Ident

D2 RESET	D1 PTT	D0 IDENT	HEX	
1	0	0	04	SPACE
1	0	0	04	SPACE
1	1	1	07	V
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	0	06	
1	1	0	06	
1	1	1	07	K
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	0	06	
1	1	0	06	
1	1	1	07	4
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	0	06	
1	1	0	06	
1	1	1	07	R
1	1	0	06	
1	1	1	07	
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	0	06	
1	1	0	06	
1	1	1	07	M
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	0	06	
1	1	0	06	
1	1	1	07	V
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	0	06	
1	1	1	07	
1	1	1	07	
1	1	1	07	
1	1	0	06	
1	1	0	06	
1	1	0	06	
0	0	0	00	RESET

* 21 Waterloo Cr Lesmurdie WA 6076
VK6UU@VK6BBS
ar

Club Corner

Redcliffe and Districts Radio Club Inc

Jottings from the club magazine QRM Vol 1,1993

Meeting Venue change

After a tenure of some 15 years, the club will no longer meet at the Education Centre. After previously being assured the club's future tenure was secure, advice was received at the beginning of December that use of the Centre in 1993 was not available. A poorly written, poorly spelled missive offered no reason, just "get out". The first meeting for 1993 will be held at the Deception Bay High School, Government Street, Deception Bay. The "weatherman" has assured the club they will be welcome.

Thanks

In the President's message, appreciation was given to the club's sponsor, Bill Daniels of COATES HIRE, and LOGICAL TECHNOLOGIES for on-going support.

Snippets

Key Link Communication has been given permission to use the club repeater site for a commercial repeater installation.

Garry Shapiro NI6T was voted as an Honourary Member with acclamation.

Classes will continue to be held under the auspices of Mick VK4AMB on the first and third Monday of each month.

Malcolm VK4AMB, son of Rodger VK4HD, obtained his full call on the first attempt, congratulations Malcolm.

Who was the club member who put more dents in himself than his Ag-Bike whilst charging across the paddock recently ?? Good thing his wife has nursing experience!

Mackay Amateur Radio Association Inc

Current Information

Meetings — Activities evening second Wednesday each month, 1930k at the SES Building, Swain St, North Mackay.

Club Net — VK4WIM/P, Monday 1930k, 3597kHz (+/- QRM); Wednesday 1945;, 147000 repeater; Friday 1945k, 28490kHz USB. (Note: daylight saving time does not apply in Queensland).

Club Repeaters

Two metres

Voice — VK4RMK tx 14700, HASL 320 metres, ERP 25w. rx 146400, good coverage Mackay area.

Packet — VK4RMK 144900, same location/power as voice repeater. 144900, location 30km ENE of Nebo. HSAL 800m, ERP 25w (links Mackay/Central Highlands, thence Rockhampton and south).

70cm

Voice — VK4RMU tx 438125, HASL 40m, ERP 75w. rx 433425 H pol beaming north/south from Andergrove (North Mackay).

Moorabbin and District Radio Club

Annual Hamfest

The increasingly popular Hamfest will be on again this year.

The date is Saturday 1st May, 1993, and the venue is Brentwood Secondary College in Watsons Road, Glen Waverley.

The hours are from 10am to 3.30pm.

Entrance fee is $3-00.

There will be very comprehensive displays from the various suppliers, plus a very busy trade in pre-loved gear.

Monthly Meeting

The speaker at the monthly meeting on Friday 16th April will be Mr Marcus Grinblat from the Sandringham operation of the Australian Volunteer Coast Guard Service.

Allan Doble VK3AMD

Radio Amateurs Old Timers Club

Members and others interested are asked to note that as from the March broadcast, and until further notice, the morning series of transmissions on the first Monday of each month on 2, 20, and 40 metres, will be repeated the same evening on 80 metres. The preferred frequency will be 3.635 MHz, and the time will be 8.30pm EAST (1030Z).

This transmission should be well received in VK2, VK5 and VK7, as well as VK3, and enable reception by those unable to be home for any of the morning transmission.

Allan Doble VK3AMD
ar

Awards

John Kelleher VK3DP Federal Awards Manager

Worked all States (WAS)

The WAS (Worked all States) award is available to all amateurs worldwide who submit proof with written confirmation of having contacted each of the 50 states of the United States of America. The WAS awards program includes 10 different and separately numbered awards as listed below.

Two-way communications must be established on amateur bands with each state. Specialty awards and endorsements must be two-way on that band and/or mode. There is no minimum signal report required. Any or all amateur bands may be used for general WAS. The District of Columbia may be counted for Maryland.

Contacts must all be made from the same location, or from locations no two of which are more than 50 miles apart, which is affirmed by signature of the applicant on the application. Club-station applicants, please include clearly the club name and callsign of the club station (or trustee).

Contacts may be made over any period of years. Contacts must be confirmed in writing, preferably in the form of QSL cards. Written confirmations must be submitted (no photocopies). Confirmations must show your call and indicate that two-way communication was established. Applicants for specialty awards or endorsements must submit confirmations that clearly confirm two-way contact on the specialty mode/band. Contacts made with Alaska must be dated 3 January 1959 or later, and with Hawaii dated 21 August 1959 or after.

Specialty awards (numbered separately) are available for OSCAR satellites, SSTV, RTTY, 432MHz, 144MHz, 50MHz and 160 metres. Endorsement stickers for the basic mixed mode/band award and any of the specialty awards are available for SSB, CW, EME, Novice, QRP, packet and any single band. The Novice endorsement is available for the applicant who has worked all states as a Novice licensee. QRP is defined as 10-watts input (or five-watts output) as used by the applicant only, and is affirmed by signature of the applicant on the application.

Contacts made through "repeater" devices or any other power relay method cannot be used for WAS confirmation. A separate WAS is available for OSCAR contacts. All stations contacted must be "land stations". Contact with ships (anchored or otherwise) and aircraft cannot be counted.

HQ reserves the right to "spot call" for inspection of cards (at ARRL expense) of applications verified by an HF Awards Manager. The purpose of this is not to question the integrity of any individual, but rather to ensure the overall integrity of the program. Failure of the applicant to respond to such a spot check will result in non-issuance of the WAS certificate.

Disqualification: False statements on the WAS application, or submission of forged or altered cards, may result in disqualification. ARRL does not attempt to determine who has altered a submitted card; therefore do not submit any marked-over cards. The decision of the ARRL Awards Committee in such cases is final.

Application Procedure (please follow carefully): Confirmations (QSLs) and application form (MCS-217) may be submitted to an approved ARRL Special Service Club HF Awards Manager. ARRL Special Service Clubs appoint HF Awards Managers whose names/addresses are on file at HQ.

Be sure when cards are presented for verification (either locally or to HQ) they are sorted alphabetically by state, as listed on the back of application form MCS-217.

Five-Band WAS (5BWAS)

This award is designed to foster more uniform activity throughout the bands, encourage the development of better antennas and generally offer a challenge to both newcomers and veterans. The basic WAS rules apply, including cards being checked in the field by Awards Managers; in addition 5BWAS carries a start date of 1 January 1970. Unlike WAS, 5BWAS is a one-time-only award; no band/mode endorsements are available. Contacts made on 10/18/24MHz are not valid for 5BWAS. In addition to the 5BWAS certificate, a 5BWAS plaque is available at an additional charge.

DXCC Profiles — Ken Jewell VK3AKK

"I was first licensed in 1962 as VK3ZNJ after I completed my technicians training at the RMIT, and spent the next 14 years on VHF. I suppose I was bitten by the DX bug by my limited exposure on six metres initially, then on field days with VK3APC. Others who let me take over their shacks and work DX were the late Reg Waters VK3AWV, and Geoff Wilson VK3AMK. I operated from Beaumaris until I got married and moved to the Geelong area where I still live.

The procrastination ceased in 1976 when I became VK3AKK, which was formerly held by Ken Nisbett who moved to NSW, and was pleased to release the call to me. Since then I have had around 40,000 QSOs and have qualified for all of the following major awards: 5 BAND DXCC, 5 BAND WAS, WAZ on 20, 15, 10, WAJA, DLD 200, USA County award 1000 on 10 metres, all DXCC countries (305 worked on 10m).

To achieve the results I have has not been that easy, but it has not taken a really spectacular station. I have always used a three-element triband beam at 45 feet or inverted vees for the lowbands. The transceiver is an Icom 745 which drives a Yaesu FL2100B, and the linear has not changed since I started. So you see the station is quite average and can be seen in similar fashion in shacks all over the country.

Some advice for those looking to complete all countries or just starting, is first of all listen to what other DXers are talking about and make notes. Also develop a network of contacts, as you cannot watch the bands all the time; make a wanted list which you keep handy and send copies out to your friends as they may hear the one you need and call you. Learn the characteristics of the bands as to when the propagation is best to the various parts of the globe. I have worked hardly any of the countries for DXCC after midnight or before 7am, so you do not have to lose sleep and upset your wife.

I have just passed my 50th birthday, am married to a nurse and have one son doing VCE. I am employed by Telecom, where I have been for 30 years, and my current job assignment is as a Systems Consultant."

ar

WIA News

New RTTY/AMTOR Book

Amateurs keen on experimenting with RTTY and AMTOR communication modes, would be interested in a new book from the ARRL called "Your RTTY/AMTOR Companion".

It is the latest addition to the ARRL's "Companion" series and is written for amateurs exploring these modes for the first time.

For those new to amateur radio, RTTY — "radioteletype', you may remember — is a form of long-distance digital communication used on the HF bands. AMTOR is a variation of RTTY involving an error-detection system, which has become quite popular.

The author, Steve Ford, WB8IMY, describes in detail how both modes operate and shows how to set up a basic RTTY/AMTOR station so you can enjoy "keyboard" conversations with other amateurs.

AMTOR "APLink" bulletin boards are also covered. These provide links between the long-haul AMTOR network around the world and local VHF/UHF packet radio networks and bulletin boards. Amateurs send "mail" messages and circulate bulletins around the world via this network.

The new book also includes coverage on the new digital modes of PacTOR and CLOVER beginning to spread on HF.

Enquire from your Division. We hope to have a review for readers in a forthcoming issue of AR.

ar

ALARA

Robyn Gladwin VK3ENX *

New District Callsign

Queensland ALARA members now have a district YL group — the District Radio Ladies — with their own callsign, VK4DRL.

They hope to cover the area south to Bundaberg and north to Mackay, not forgetting Longreach and Winton. The aims are to have more social events and to encourage more women to become radio amateurs. Anyone interested in joining the group should contact Robyn Pye, VK4RL, QTHR.

Exchange Student

Adele Hope, ZL1TMD, is a Year 10 student on a short term exchange to South Australia from New Zealand for three months. Her parents are both amateurs and all three are working towards their full call licence. Adele is an honorary member of WARO, a privilege extended to her for having a Limited call at age 14. We wish her all the best for her stay in VK5.

New Address

Our VK5/8 Representative, Meg Box, VK5AOV, wishes to inform ALARA members that she has a new postal address. She is now settled in her new home high above the Murray River and can be reached at Box 2130, Murray Bridge, 5253. Her packet address will remain the same, VK5AOV@VK5WI.ADL.SA.AUS.OC.

Tennessee Visitors

Merilyn, VK5AAE/WA4NRX and her OM, RAOUL, VK5AIG/K4EAJ, have been on holidays in Australia. Merilyn has come up on the ALARA Net on a number of occasions. They have recently visited VK3 and were based at Anglesea, near Geelong. One of the highlights of their Victorian stay was a trip to Mildura to see Marilyn, VK3DMS.

Japanese Guests

Akemi Tahara, JK6ARD, and her son, Hirotsugu, JM6EAW, are visiting VK3. They are the guests of Ted Struys, VK3DGC, who met Akemi on air some years ago. Ted and his wife, Margaret, stayed with Akemi and her OM, Hironobu, when they were in Japan and now they are able to repay their kindness. Alara members in Melbourne are looking forward to meeting Akemi and her son, Hirotsugu has done well to have his amateur licence at age 11.

33

* *Box 438 Chelsea 3196 VK3ENX@VK3YZW*

ar

Pounding Brass

Gilbert Griffith VK3CQ *

Electronic Keyer and Paddle Technique

Most Morsiacs at some time or other put aside their hand pump and try a paddle and keyer combination. Some enthusiasts have a stable of keyers and a number of paddles and one of those combinations ends up as the favourite. This can cost quite a bit these days, so it pays to try out another amateur's gear if you get the chance.

The unofficial standards for right handed operation are dots on the thumb, and dashes the index finger. This convention followed the introduction of mechanical "bugs" which required the dexterity of the index finger to generate the correct length of dash, while the thumb operated the "automatic" dots. The standard connection uses shielded twin lead from the paddles to a quarter inch stereo plug, with the dot paddle connected to the tip. The dash paddle to the other shielded wire and the earth to the braid (to shield against RF). Most transceivers with built-in keyers use this system of wiring so you can try your paddles in many rigs.

Although the simplest way to change the sense of the paddles is to turn them upside-down, if you are building a kit yourself it pays to install a polarity switch on the input from the paddles to the keyer. You can do this on the paddle if you like but most keyers have panel space to spare.

Now you can try sending with your left hand. With the dots on the left thumb etc, this is not as hard as you might think, and if you let your hand do the work you will find that the mistakes come only when you think about what you are doing. It will take a little practice to get up to speed, especially with a few of the letters. My trouble comes with p, x and z, but you might have different ideas. Anyway this will leave your right hand free to handle the pen or the tuning dial, or whatever. I wish I had learned left handed right from the start, so if you can do so, start with your non-writing hand if at all possible, even though it is easy enough to retrain later, time consuming, but easy.

. . . if you have already bought a transceiver and a Keyer you might as well splurge on good paddles as well.

There are two basic types of paddles used today, and I am not going to refer to mechanical bugs, which in my view should be in museums. The most common paddle is the iambic or "twin lever" paddle, called iambic because there are two completely separate switches so you can squeeze both paddles together to get the iambic rhythm of "didahdidahdidah".

Non-iambic paddles have only one lever and are sometimes called slap paddles because you have to slap them from side to side to generate each element. As a rule, people who learn to use slap paddles hardly ever bother to re-learn iambic sending when they get a twin lever paddle. They should consider that they could be cutting their movements by about 57% by learning the proper techniques of the particular iambic letters which are r,k,f,l,c,q and y. Sometimes called the "Iambic Seven'.

Modern transceivers usually have a keyer as part of their design, or at least available as an option costing about the same as a kit of parts would cost without the box. So if you are paying for all the bells and whistles on that new rig, it will pay you to build or buy a good paddle and learn to use it properly. There is nothing to stop you from banging a few nails into a block of wood and bending a piece of shim brass to suit and trying iambic paddling. Or you can spend a couple of hundred on the best you can find. Gary Bold, ZL1AN, says about keyers that he sends as well with his "nails and firewood" paddle as he does with his Brown Bros paddle, and that "The quality of the keyer Morse I hear is almost totally unrelated to the cost of the paddle in use".

There are two opposing schools of thought on this subject. One advocates starting with a cheap or junk-box paddle which is used to learn on before spending money on more expensive paddles. My view is the opposite, and if you have already bought a transceiver and a keyer, you might as well splurge on good paddles as well. They might not make your sending any better, but the fact that you have invested more heavily in them will give you more incentive to master them, and just looking at a shiny new paddle will make you feel good.

Most electronic keyers have as a part of their design a thing called a dot-memory. Imagine you are going to send a "k'. you close the dash paddle then the dot paddle, then the dash paddle again. The timing of the dot is in the order of milliseconds. With dot-memory you close the dot paddle anytime after the dash paddle and up to when it is needed after the dash, this gives you nearly four times the leeway in timing, which can be critical on a slap paddle. What happens is the keyer holds the instruction from the dot paddle in memory until the correct time (after the dash) to send it. That little dot will be sent, even if you have closed the dash paddle again before it is sent.

It is also why the keyer sends iambically (remember didahdidahdidah) and some blurb sheets refer to it as a dot-dash memory. To confuse clots like me I guess.

The classic example of the advantage of using iambic sending is illustrated in the letters c and q. In conventional manual or slap keying the operator moves the lever to the dash side, the dot side, the dash side and back to the dot side before releasing (for a c). Then back to the dash side twice, or hold there for two dashes, over to the dot side, back to the dash side and then release. Result, CQ, the most commonly sent letters in 8 movements. The iambic operator merely squeezes the two paddles, making sure to lead with the dash paddle, waits until the second dot starts, and releases both paddles together. After waiting for a "letter" space the dash paddle is pressed and held, and after the second dash starts, gives a flick on the dot paddle, finally releasing the dash paddle when the dot is sent. Result, economy in motion.

Here are a few tips which may be helpful if you wish to convert from non-iambic to iambic sending. Stick with your decision and retire your old paddle to the cupboard. Your old

habits will be impossibly hard to break if you keep going back to them. For the first few days try to relax and just send code until you get used to the feel of the new paddles. This is best done off air, perhaps reading from a book, until you make fewer mistakes. When you have time to think you can start by thinking about one letter at a time and after a little exclusive practice on that letter you can start sending it iambically in context. You may feel like trying more at one time but I recommend sticking with the one letter until you can send it iambically without thinking, then go on to the next. I started with k and r then added c and full-stop and left f and l to the last as they seemed to me to be the most difficult. Don't be discouraged if you occasionally slip back to the old habits on one or two letters, especially if you are excited at the time. This usually means you are like me and not getting enough practice, nothing more.

If you are already using iambic techniques there is another choice to make when selecting a keyer. You may have heard about the type "A" and type "B" devices from Curtis Electro Devices. It is very hard to describe the difference but the type "B" device is explained as adding an element of the opposite type when you release the paddles. If you are a type "B" operator and you run across a type "A" device try sending "CQ". If the device is type "A" you will probably get "KG" or possibly "KQ". If you are a type "A" operator you will probably get an extra dash at the end. Most built-in keyers and memory keyers on the market are type "B" so if you must choose, I suggest starting with the most common. The 8044 ABM chip has both and the "A" type seems much harder to use to me. The effect is similar to that which I get when I switch off the dot-dash memory on my ETM-8C keyer. The other feature which many people will have seen is the auto-word-space as found on the accu-keyer kits. (EA March 1978 I think) Auto-word-spacing is a very handy feature in that it makes the sending less critical for perfect Morse. I wonder why it is not incorporated on the Curtis chips? What happens is that the keyer remembers when the last character or element was sent, and if the next element is sent too late (longer than three dot lengths is the letter spacing if I remember correctly) the keyer waits a further few dot lengths before starting to send the next element. That is, provided you wait a little longer than a letter space you will automatically get a full word space. This feature is excellent for speeds up to about 30 WPM after which, depending on your expertise and your paddle, mistakes such as "ET" when you want "A" or "EG" when you want a "P". At this time you will be going pretty fast anyway and should be able to handle the word spacing without help so you can switch the auto-word-spacing off.

If you are like me you will have two or three keyers and assorted paddles, maybe all on the bench at the same time, with the hand pump tucked away in the corner somewhere. Iambic keyers are for the lazy. If you want to send reasonably good Morse for the least energy output, then they are for you. I have nothing against the hand key or the purists who don't want to give them up. It is a welcome change to reach for the old brass key and have a go from time to time, but for efficiency the only way to beat the keyer and paddle combo is to use a computer or keyboard. And that is not hand sending, so it seems to lose a bit of the fun. I am a little surprised that they are not as yet allowed when taking the licence exams.

73

Gil VK3CQ
** 7 Church Street Bright Vic 3741*
ar

IARUMS — Intruder Watch

Gordon Loveday VK4KAL *

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

LR084 SUCCESSFULLY REMOVED

After continued monitoring by the IARUMS, and subsequent action by the IARU Region II authorities, the Argentinian Weather Fax station LRO84 has now been removed from 18.093 MHz. This was due to positive representation by the administration, and is a very good example of how the IARU Monitoring Service can assist in protecting our frequencies.

Information from ZL1CV, Region III IARU Co-ordinator, in conjunction with the IARU Region II Co-ordinator.

Notes relating to the IARU Monitoring Service

On looking through old log sheets, it appears not sufficient information is being collected from each intrusion, in particular the F1b modes. The details are very scrappy, and I give the following examples:

28525 0626z 200989 H3E caused harmful int/f to my signal, by the way H3e is 3K00H3EJN, s ch SSB full carrier, and for F1B mode "a strong RTTY signal prevented me from using the frequency.

This is useless, we want the frequency shift, for ALL RTTY signals to have any chance of the monitoring service or DOTC, to get even an idea who and where they may be. Observers be POSITIVE even if you only fill half a page.

Don't waste time logging CB carriers outside VK they are impossible to trace.

A RTTY log should look like this:

14035.5 0625z 090590 F1b RTTY 300 Hz shift
14124 0540z 050990 F1b " 250 Hz idling
14119.5 0530z 060990 " " 1000 Hz shift.

These give info which can be followed up, with a good chance of identification, somewhere in the monitoring service.

The first real step in eradication of any pest is its ID, then persistent attacks are made on it, which is where we amateurs come in.

In the box is a list of recently logged intruders.

Jamming Signals

One of the more interesting ones we suffered some years ago, was between USSR and China. The Russians would transmit propaganda, or what have you, to China, who would promptly use it to jam the incoming signals, only they would transmit it in reverse I I'll leave the reader to imagine the result, especially if this was carried on ad-infinitum.

The MS is quite often asked to determine whether or not jamming is taking place on a reported frequency.

A brief description follows on some other types.

There are 3 types of jamming methods:-
SPOT which jams only 1 ch at a time.
BARRAGE, which jams several adjacent ch at a time.
SWEEP (quite common) which is a narrow band signal swept to and fro over a wide freq band.

1. Unmodulated carrier. This type of jamming, if strong enough will completely eliminate all other signals.
2. Random keyed CW. This signal consists of an unmodulated signal keyed at random, whereas keyed CW is similar to above but morse characters are transmitted at the same rate or slightly faster than the victim signal.
3. Spark. This consists of numerous bursts of noise at short duration, hi-intensity and hi-repetition rate. It is produced by broadcasting the noise made by the sparking brushes of an electric motor or similar source of impulsive noise.

Jamming is a system used most by the military forces of all nations and usually reaches a peak during times of conflict. The majority of jamming in the amateur fraternity is caused inadvertently by inexperience or careless procedures. I will have more to add about jamming next time.

* *Federal Intruder Watch Co-Ordinator*
Freepost No 4 Rubyvale Qld 4702 or
VK4KAL@VK4UN-1

ar

Intruders Logged Dec 1992-Jan 1993

FREQ	UTC	DATE	MODE	ID	COMMENTS
Dec 1992					
7002.5	1135	141292	a1a	V	Beacon
7039.5	0910	181292	a1a	F	"
7048/9	1100	141292	mxd	UHF3	F1 Cw/F7b hvy tfc 5fig
10102	1135	151292	A3c		Wx fax ARG
14003	0520	161292	NON		
14026	0720	051292	PXX		2 voices — foreign
14058	0834	031292	F7b		Data only
14062+	0620	141292	mni		Data/pulse, Chn
14070	1033	121292	a1a		5 ltr groups
14209.5	0750	151292	mxd		F1 CW and data CIS
14210	0935	141292	A3e		BC stn 2f 7105
14211.5	0940	141292	F1b		RTTY to 14215 CIS
14217.5	1030	151292	mxd	UMS	NON, F1b, A1a 250 Hz, CIS
18092	0930	141292	A3c	LR084	Wx fax, Buenos Aires
21031.5	0545	151292	mxd	MNR	A1a, F1b, tfc in A1 CIS
21283.5	0900	151292	mxd	MNR	as above 250 Hz CIS
24950	0600	141292	A3e	R Peking	5F of 4.99 MHz CHn
Jan 1993					
3667	1845	020193	J3e/u		BC station, Asian ??
7002.5	1150	020193	A1a	V	Beacon CIS
7039.5	1145	020193	A1a	F	"
7048	1155	020192	mxd	UHF3	5 fig blocks CIS
10102	1138	020193	A3c		Wx fax, drum sp 120
14058	1015	030193	mxd		F7b Chn origin
14140	1023	050193	F1b+	MNR	A1a, UMS Moscow CIS
14209.5	0950	030193	mxd		F1 cw Russian morse
14210	1045	020193	A3e		2f of 7105 MHz
14250	1019	040193	NON		Jammer, B9w, R7b
14284/6	1030+	daily	A1a	VRQ	tfc, key clicks etc, Vietnam
18075	1240	260193	A3e		BC station Middle East — Music
21031	0300	110193	mxd	MNR	tfc cw to UUU UMS CIS
21316	0528	200193	mxd	VVH	A1a, R7b 4 kHz wide
21445	1146	daily	A3e		Music and splatter
24950	0520	040193	A3e	R Peking	%f of 4.990 Chn
24892	0504	310193	A3j?	Marine Band	radio tfc txt "ARS 213 07/08 regards master K".
Late Arrivals					
21283.5	0845	040193	mxd	MNR	F1b, A1a tfc to UUU UMS
24960	1050	170193	A1a	JQ	VVV I42 de JQ repeated
28620	1044	220193	A3e		BC station, Russian language

Many thanks to VKs 4AKX, 4BTW, 4BXC, 5TL, 5WC, 6RO.

QSLs from the WIA Collection

Ken Matchett VK3TL Hon Curator WIA QSL Collection *

Navy — Senior Service Part 2

The year 1986 saw the 75th anniversary of the Australian Navy. During this year a special effort was made by operators of the VK3RAN station to activate the station frequently so that the greatest opportunity was given for other amateurs to qualify for what is known as the "Castlemaine Award", details of which appeared in the July 1986 issue of AR. The ship itself is a Bathurst class corvette/minesweeper which was built at Williamstown and was commissioned in 1942. She served with distinction in northern waters during World War 2, mainly as an escort ship. After the war she became a training ship and eventually was restored as a museum ship in June 1974. Readers are referred to the article entitled "HMAS Castlemaine", which appeared in the September 1986 issue of AR.

VK2CC

The station VK2CC is the club station of the NSW chapter of the RNARS. It is the "Sydney" Training Depot located on Snapper Island, a rocky island off the coast of Drummoyne, NSW. The interesting story of the establishment of this training centre is to be found in the article "Snapper Island: Part of Sydney's Maritime History" by CW Schreuder VK2CWS, which was published in the January 1992 issue of AR. The HMAS Sydney, which ship engaged the German cruiser "Emden" in September 1914, and which played a most notable role in Australia's maritime history, was sadly sold to Japan for scrap during the Great Depression, but not before several items were removed from the doomed ship and which are now housed in the "Sydney" Training Depot, named in honour of that great ship. It is to the credit of the operators of this station that a considerable number of their QSL cards have been despatched to stations throughout the country.

Yet another RNARS Australian station is VK2BNR. This is the club station of "HMAS Nirimba" (RNARS member number 1385) and which can only be operated by a serving RAN amateur based on board. The name "Nirimba" is said to be an Aboriginal name for pelican. The QSL collection holds a few of such QSLs as well as those of VK6RAN and VK5RAN (the club stations of the West Australian and South Australian RNARS).

VK2BST

Mention should also be made of the operation of Surgeon Rear Admiral Jim Lloyd RAN. This distinguished radio amateur has been quite active from his early days in the Navy with the call VK3CDR, although he did hold other calls including G3DKI and VK3AST. One of his VK3AST QSLs dated August 1963 (when he then held the rank of Surgeon Commander) reads: "VK representative, Royal Navy ARS." His early 1954/55 VK3AST QSLs indicate his rank as a Surgeon Lieutenant. During 1967 Jim transmitted from VK2BST, the station callsign of the Naval Air Station at Nowra, NSW, whose very imaginative QSL card is reproduced here. His present callsign is VK1JL. An active executive officer in the WIA, Jim was featured in the February 1977 edition of AR.

VK4RAN

The WIA Collection also contains QSLs of the station VK4RAN. This is also a maritime museum ship, the former HMAS "Diamantina", named after the famous river system in Queensland. The ship is a River Class frigate designed in Great Britain and was used mainly during WW2 as an anti-submarine vessel. She served in New Guinea and Solomon Islands waters. The surrender of Japanese forces on Nauru, Ocean Island and Bougainville Island was signed on board this vessel. Restored as closely as possible to her original condition, she now rests in dry dock at South Brisbane. The radio station VK4RAN on board the maritime museum (operated by the Queensland Maritime Museum Association) is also a member of the RNARS.

As well as its large collection of amateur radio QSL cards, the WIA collection also holds several post-war and pre-war QSLs of commercial radio stations, ship stations and shore stations. Amongst these may be found station VJLQ1 operated by KW Harris aboard HMAS "Albatross" VZDB Naval Staff Office at Port Melbourne, and giving details of its spark transmitters, VJMP on HMAS "Success" (dated October 1929) and VHE, the Royal Australian Naval Reserve Radio Club at the Naval Depot, Port Adelaide SA. (several QSLs dated 1935). Like amateur radio QSL cards, the above are all part of the fascinating history behind QSL cards.

Author's note

As an interested reader of this series of articles on the story behind QSL cards, would you like to add your name to the hundreds of other amateurs who have contributed cards to the collection? All donations are acknowledge personally as well as being recorded in this column. Please contact the author, who is also the honorary curator of the collection. Arrangements can be made for the delivery of sizeable donations. Please help in this worthwhile project.

Thanks

The WIA (Vic Div) would like to express its thanks to the following for their generous donations of QSL cards: (supplementary list)

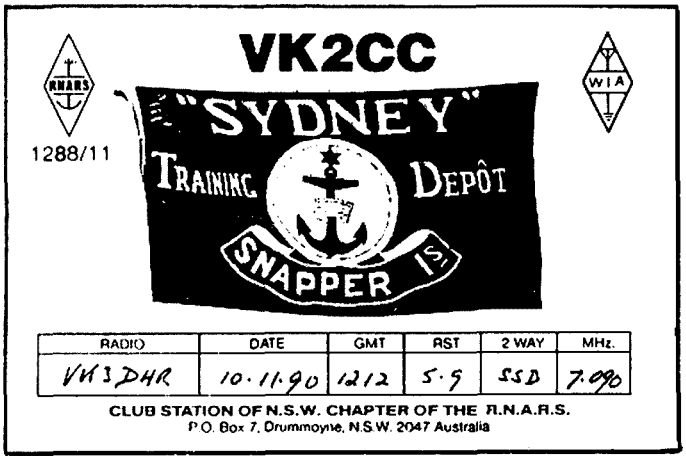
Chas	VK7CH
Bill	VK2WS
'Snow'	VK3MR
Mike	VK6HD
Garnet	VK3MTA
Eric	VK4XN
Brian	VK4LV

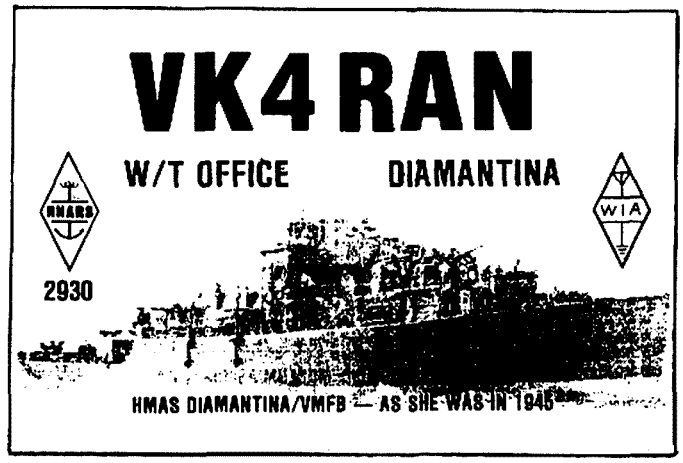
Also to the family and friends of the following "Silent Keys" (supplementary list)

Joe Brown	VK7BJ via courtesy of Chas VK7CH
Derek Baker	VK3IL (ex G3NP)
Graham Colley	VK3QZ

* *4 Sunrise Hill Road, Montrose, Vic 3765*
Ph: (03) 728 5350

ar





Spotlight on SWLing

*Robin L Harwood VK7RH **

In last month's column, I did mention that Radio WEWN in Birmingham, Alabama was having some serious RFI problems in the community. Well, this Catholic religious broadcaster seems to have overcome these temporary problems and is now back on-air. I'm hearing it at around 0655 UTC on 7465 kHz when they have a short 5 minute English talk, before going into Dutch. Most of the program content revolves around the Catholic Rosary.

The new Clinton Administration in America has severely curtailed funding for their surrogate broadcasters based in Munich, Germany.

This service was created at the height of the Cold War to broadcast news of what was happening inside Eastern Europe and the Soviet Union.Known as "Radio Free Europe" and "Radio Liberty", the station came under constant severe jamming until 1987 when it was lifted as part of "Glasnost". As a result of the momentous political changes in Europe in 1989-91, we have seen the mushrooming growth of an independent print and electronic media. RFE/RL is now being openly relayed inside their target areas over medium wave and FM transmitters. Therefore the Administration sees no further need to fund it beyond 1995, when it is expected that RFE/RL could be off-air.

The other surrogate broadcaster sponsored by the Americans is "Radio Marti". This Spanish language station broadcasts to Cuba around the clock from Washington via the Voice of America transmitters on both medium and shortwave. "Radio Marti" is a part of the VOA output as is a TV service in Florida, which has a sender mounted up from a tethered balloon at a high altitude. It broadcasts from 3 am to 6 am Havana time. However, there are few viewers there as the Cubans have mounted a sophisticated jamming campaign. Yet the sizeable Cuban expatriate community in Florida do indeed support it and won't allow it to be closed.

There are other clandestine anti-Castro operators about and are easily heard on shortwave."La Voz dell C.I.D." has been around for over a decade and is rumoured to be located in Central America. You can hear it on 6305 kHz from 0700z until 1200z as well as on 7385 kHz, where it is weaker.Another station is "Radio Caiman" around 9965 kHz. It too is believed to be in Central America. The best time to catch this one is around 1200z. These two stations regard the official "Radio Marti" as being too tame. Other anti-Castro organisations are quite content to hire air time over American commercial and religious broadcasters on HF plus over numerous AM/FM outlets in Florida.

The BBC External Services re-introduced Albanian on the 28th of February, after a 26 year break. Many will recall that Albania was a closed country for 40 years under the hardline Marxist dictator, Enver Hoxha. Their shortwave voice "Radio Tirana" was perhaps the most boring station ever on shortwave over that period. Tirana was easily heard by many amateurs as it used to pop up on our exclusive allocations on 20 and 40 metres. Now you're lucky if you are able to hear it as the shortwave service has all but disappeared. The "Beeb" will ironically be utilising that 1200 KW MW sender in Albania that had a hefty signal in SE Europe. There are sizeable Albanian minorities in the Kosovo region of Serbia and in Macedonia.

A number of independent stations in the Russian Federation have recently closed down, not because of political pressure, but because of their inability to pay the required fees to the various transmitter sites.Included in this is "Radio Ala" which was popular because of their folk music. In the former Soviet Union, there are hundreds of broadcasting sites and many broadcasters have found it cheaper to lease time over these sites, rather than installing their own. But as you are probably aware, these nations are pressed for hard currency and no cash no leases is the policy. Even Radio Moscow World Service reportedly is in financial trouble coming up with the cash to the operators of these sites. That is why the religious organisations are leasing these sites as they can pay cash, as are the western broadcasters such as Deutsche Well, the BBC, VOA and Radio Netherlands, etc.

In conclusion, here are a few brief snippets.

Argentina's external service was recently monitored here at 0900z on 11710 kHz in Spanish to Japan. Signals were good.

North Korea is now jamming all broadcasts on shortwave in Korean. The VOA and the South Koreans have noted a dramatic increase as from November 1992.

The Belgian broadcaster "Radio Vlanderen-Radio Flanders International" is well heard here at 0630z on 9905 in English. On Sundays, there is a short DX program — "Radio World". The VOA and Kol Israel have abandoned plans to establish an HF site for VOA/RL in the Negev Desert in Israel.This apparently upset the environmentalists who were worried about it upsetting the flight plans of thousands of migratory birds from Asia to Africa, who pass over the site.The VOA have a better site in mind — Kuwait.

Well, that is all for this month. Don't forget, you can leave messages on Packet as follows VK7RH @ VK7EKA. — 73 DE VK7RH.

** 52 Connaught Crescent West Launceston Tas 7250*

ar

Technical Correspondence

10 Gigahertz Hurts!

A safety note for those of you experimenting in the 3cm amateur band. We've been advised by Mark VK2XOF of the Gladesville ARC, and by Lyle VK2ALU of the WIA Federal Technical Advisory Committee, that some amateurs have recently obtained tellurometers with a view to conducting experiments around 10GHz.

Please be aware that a safety hazard exists with any equipment operating at these frequencies, especially when operating in enclosed areas, and where children may gain access to the equipment.

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

At all times avoid looking into the open end of the waveguide, and make sure curious children do likewise, as serious eye damage can result.

Mark Blackmore VK2XOF and
Lyle Patlson VK2ALU

Baycom Review Update

As a consequence of the review of the Baycom packet modem which appeared in the January 1993 issue of AR, the Australian Amateur Packet Radio Association (AAPRA) has received responses which suggest that some points need further clarification.

1. The Baycom software as presently developed will run only on an IBM-compatible computer.
2. The Baycom modem is supplied with a copy of Baycom s/w Ver 1.5 which is registered by the authors in Germany and is obtainable from AAPRA, the only authorised distributor in Australia.
3. The price of the modem, ver 1.5 software and a comprehensive Australian manual is $190, which also includes 12-months membership of AAPRA.
4. A registered copy of the Ver 1.5 software and the manual is available from AAPRA at a cost of $25.

To place an order or to obtain further information about the Baycom program, please address: The Secretary AAPRA, 59 Westbrook Av, Wahroonga, NSW 2076.

When ordering, please specify size of disk required, and include an SASE if a reply by mail is necessary.

Geoff Page VK2BQ
ar

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 Ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

All circuits are short path unless stated as long path (L/P).

The sunspot number used in these calculations is 71.4 while the predicted value for May is 68.6 and for June it is 65.6.

ar

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.9	11	9.4	10	2	-8	-24	...
2	12.9	8	9.9	8	3	-5	-18	-35
3	12.5	2	9.5	4	1	-6	-20	-36
4	15.5	4	11.8	1	4	0	-7	-19
5	21.3	7	16.5	-2	6	7	4	-2
6	25.3	7	18.6	-4	7	9	7	2
7	25.4	7	19.0	-4	7	9	7	3
8	23.7	8	18.9	0	9	9	6	1
9	21.5	9	17.0	4	10	9	4	-3
10	19.2	9	15.1	7	10	7	0	-9
11	16.9	11	13.3	11	10	4	-5	-17
12	15.1	13	11.9	13	8	0	-12	-27
13	13.9	17	11.0	16	8	-2	-18	-36
14	13.2	21	10.4	19	7	-6	-24	...
15	12.6	26	10.0	21	6	-8	-29	...
16	12.3	28	9.6	21	5	-10	-32	...
17	12.0	29	9.1	21	4	-13	-36	...
18	11.5	31	8.5	20	1	-17	...	...
19	10.9	31	8.1	18	-2	-22	...	...
20	11.4	31	8.0	19	0	-18	...	...
21	11.3	30	7.8	19	-1	-19	...	...
22	10.9	28	7.6	15	-4	-22	...	...
23	10.4	19	7.4	10	-7	-24	...	...
24	11.0	14	7.9	9	-4	-19	...	...

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	10	10.1	10	8	2	-7	-20
2	14.6	12	9.9	12	8	1	-10	-23
3	14.2	14	9.8	14	9	1	-12	-27
4	13.5	18	9.4	17	8	-1	-16	-33
5	13.0	22	9.2	20	8	-3	-20	...
6	13.5	25	9.7	23	11	0	-17	-36
7	15.5	22	11.3	25	16	7	-6	-21
8	18.7	19	13.7	25	21	14	5	-6
9	15.9	17	12.2	17	14	8	-1	-13
10	15.0	9	11.5	9	8	3	-5	-17
11	14.7	3	11.6	2	4	0	-9	-20
12	13.8	-3	10.9	-2	1	-2	-10	-21
13	13.2	-9	10.4	-6	-1	-3	-11	-21
14	12.9	-13	10.1	-8	-2	-4	-11	-20
15	12.6	-17	9.7	-9	-2	-4	-10	-20
16	12.0	-21	9.2	-9	-3	-4	-11	-21
17	11.3	-25	8.6	-9	-3	-6	-13	-23
18	11.8	-21	8.9	-9	-3	-4	-11	-21
19	14.2	-11	11.1	-11	-2	-3	-8	-16
20	18.3	-1	14.0	-12	-1	0	-2	-7
21	20.0	3	13.5	-9	1	3	1	-3
22	18.0	4	12.2	-3	4	4	0	-8
23	18.7	8	11.3	2	6	4	-2	-12
24	15.8	8	10.6	6	7	3	-5	-16

VK EAST Sth PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.7	24	27.6	35	37	36	34	30
2	33.0	24	27.6	35	38	37	34	30
3	32.9	24	27.2	37	38	37	34	30
4	32.5	25	26.6	39	40	38	35	31
5	31.5	26	25.5	42	42	39	35	30
6	29.5	28	23.7	47	44	41	35	30
7	27.1	30	21.5	50	45	40	34	27
8	24.6	31	19.5	50	44	38	31	22
9	22.1	33	17.5	49	42	35	26	16
10	20.1	35	15.9	48	40	32	21	10
11	18.9	36	15.0	47	38	29	18	5
12	18.0	37	14.2	46	36	27	15	1
13	17.1	37	13.5	45	34	25	11	-2
14	16.4	38	12.8	44	33	22	8	-6
15	15.8	39	12.3	43	31	20	6	-9
16	14.7	40	11.3	41	28	16	0	-16
17	13.2	41	10.1	38	22	9	-8	-28
18	13.0	41	9.9	37	22	8	-9	-29
19	16.1	37	12.2	41	31	21	7	-7
20	21.9	31	16.8	42	37	32	24	14
21	26.9	27	21.1	39	38	35	30	24
22	29.7	25	23.7	37	38	36	32	27
23	30.8	25	25.0	35	37	36	33	28
24	31.9	24	26.4	35	37	36	33	29

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.6	13	25.3	11	19	21	19	16
2	31.1	13	24.1	9	19	20	19	16
3	31.4	13	24.1	9	18	21	20	17
4	31.9	13	26.6	10	19	21	20	17
5	32.4	13	26.6	12	21	22	21	18
6	31.7	14	25.8	16	23	24	22	18
7	30.2	14	24.3	21	26	25	22	17
8	28.2	16	23.7	30	30	28	22	18
9	26.3	19	20.9	41	35	30	22	14
10	24.1	20	19.2	41	34	28	18	8
11	22.4	21	17.8	41	32	25	14	2
12	21.5	22	17.1	41	31	23	11	-1
13	20.7	22	16.4	40	30	21	8	-5
14	19.7	23	15.8	39	28	18	4	-10
15	18.5	23	14.6	37	25	14	-1	-17
16	17.7	24	13.8	35	22	10	-6	-24
17	16.1	25	12.5	32	17	3	-16	-37
18	13.9	26	10.8	25	6	-11	-35	...
19	13.3	26	10.3	22	2	-17	...	...
20	14.7	26	11.4	28	11	-4	-26	...
21	18.8	21	14.9	32	23	14	1	-14
22	26.8	16	20.8	25	26	24	19	13
23	29.4	14	23.6	18	24	23	20	15
24	29.8	13	24.3	14	21	22	19	15

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.0	8	12.2	6	7	3	-5	-16
2	15.3	1	11.6	-1	3	0	-7	-17
3	19.0	3	14.3	-8	2	3	0	-6
4	25.4	6	19.5	-16	0	6	7	4
5	30.7	8	24.0	-21	-1	6	9	9
6	31.0	7	25.4	-22	-1	5	9	8
7	30.0	7	24.3	-20	0	6	9	8
8	28.2	7	22.7	-15	2	7	9	7
9	25.9	8	21.8	-7	6	9	9	6
10	23.6	10	18.7	1	10	11	8	3
11	21.2	11	16.8	8	13	11	6	-1
12	19.3	14	15.3	15	15	11	4	-6
13	18.2	17	14.4	21	18	12	2	-10
14	17.4	21	13.8	26	20	11	0	-14
15	16.7	24	13.3	30	20	10	-3	-19
16	16.0	26	12.6	31	19	8	-6	-23
17	15.5	27	12.1	31	18	7	-9	-27
18	14.4	28	11.2	29	15	2	-16	-36
19	13.0	30	10.0	25	9	-6	-27	...
20	12.9	30	9.9	25	9	-6	-27	...
21	15.9	27	12.6	32	20	9	-7	-24
22	17.2	25	13.3	31	23	14	2	-12
23	16.3	20	12.5	22	17	9	-2	-16
24	18.6	15	14.3	16	16	11	3	-6

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.4	9	24.8	-10	5	10	12	10
2	27.3	11	21.7	0	11	14	13	10
3	25.0	13	19.9	9	16	16	13	8
4	22.9	16	18.2	19	20	18	13	5
5	21.8	19	17.2	27	25	20	13	3
6	20.9	22	16.5	35	28	22	12	2
7	20.0	24	15.9	38	28	21	11	-1
8	19.0	25	14.9	36	27	19	7	-5
9	18.1	26	14.1	36	26	17	4	-9
10	16.6	27	12.9	34	23	12	-1	-17
11	15.1	29	11.6	31	19	7	-9	-28
12	15.2	29	11.6	31	19	7	-9	-27
13	17.4	25	13.8	34	23	13	0	-15
14	16.5	23	13.0	28	19	9	-4	-20
15	15.2	19	11.8	21	14	5	-8	-24
16	14.7	12	11.4	12	8	0	-13	-28
17	13.0	3	10.0	5	1	-6	-20	-36
18	12.7	-3	9.7	0	0	-7	-19	-34
19	15.8	0	12.0	-4	1	-1	-8	-18
20	21.5	4	16.6	-11	1	4	2	-2
21	26.4	6	20.7	-17	0	5	6	4
22	28.8	6	23.0	-20	-1	5	7	6
23	29.7	7	24.1	-20	0	6	8	7
24	30.7	7	24.8	-17	1	7	10	9

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	18	9.3	17	7	-4	-22	...
2	13.1	15	10.0	14	6	-4	-20	-38
3	16.3	13	12.9	14	11	5	-5	-18
4	22.3	12	17.2	11	15	13	8	1
5	25.5	9	18.9	5	12	13	10	5
6	26.4	8	19.2	2	11	12	10	5
7	26.0	8	18.8	1	10	12	9	5
8	25.0	8	17.9	3	11	12	9	3
9	23.6	9	16.7	6	12	12	8	1
10	21.5	10	15.1	10	13	11	5	-3
11	19.3	12	13.5	13	13	9	1	-9
12	17.1	14	11.9	16	12	5	-6	-19
13	15.2	17	10.5	18	10	0	-14	-31
14	13.9	20	9.6	20	8	-4	-22	...
15	13.0	25	8.9	21	6	-9	-30	...
16	12.4	27	8.5	20	3	-13	-36	...
17	12.0	28	8.3	20	1	-16	...	...
18	11.5	30	6.0	18	-2	-21	...	...
19	11.1	30	7.9	16	-4	-24	...	...
20	10.8	30	7.8	15	-7	-27	...	...
21	11.5	30	8.3	18	-2	-21	...	...
22	11.5	30	8.1	19	0	-19	...	...
23	11.1	26	7.9	15	-3	-22	...	...
24	11.7	21	8.5	15	0	-16	-38	...

VK SOUTH Sth PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.6	14	19.6	23	23	19	11	2
2	24.0	15	20.4	24	24	20	12	3
3	24.0	15	20.1	25	25	20	13	3
4	23.9	16	19.8	27	26	21	13	3
5	23.5	17	19.2	31	28	22	13	3
6	22.2	20	18.0	37	30	23	12	0
7	20.2	23	16.1	38	29	19	7	-7
8	18.2	24	14.4	36	25	13	-2	-19
9	16.2	26	12.8	33	19	5	-13	-34
10	14.5	28	11.5	30	12	-3	-26	...
11	13.4	29	10.6	26	6	-13	-38	...
12	12.4	30	9.8	22	0	-21	...	...
13	11.7	31	9.3	19	-5	-27	...	...
14	11.3	32	8.9	16	-9	-32	...	...
15	11.0	32	8.7	15	-11	-35	...	...
16	10.8	32	8.3	13	-13	-39	...	...
17	10.2	33	7.8	10	-18	...	...	...
18	9.7	34	7.4	6	-25	...	...	...
19	10.1	31	7.6	8	-20	...	...	...
20	12.0	22	9.0	15	-3	-23	...	...
21	15.6	18	11.9	21	11	0	-18	-37
22	19.1	16	14.9	23	18	11	-1	-15
23	21.6	15	17.2	23	21	16	7	-4
24	22.7	15	18.5	23	22	18	10	0

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	-4	9.3	-3	-1	-6	-15	-28
2	12.9	-1	9.0	1	-1	-7	-19	-33
3	12.5	2	8.9	3	-1	-9	-22	-38
4	12.0	4	8.7	5	-1	-11	-26	...
5	11.7	8	8.5	7	-2	-13	-30	...
6	12.2	11	9.0	9	0	-11	-28	...
7	13.8	13	10.3	13	5	-4	-19	-35
8	16.1	14	12.1	16	11	3	-7	-21
9	18.4	14	13.8	17	14	9	0	-10
10	19.1	12	13.0	15	13	9	1	-9
11	15.8	8	11.4	7	7	2	-6	-17
12	15.0	1	10.1	0	1	-2	-11	-23
13	13.8	-5	9.3	-4	-1	-5	-14	-26
14	13.0	-11	8.7	-7	-3	-7	-15	-26
15	12.4	-17	8.5	-9	-4	-7	-14	-25
16	12.0	-21	8.1	-10	-5	-7	-14	-24
17	11.6	-31	8.0	-16	-9	-11	-19	-29
18	11.1	...	7.8	-21	-14	-17	-25	-37
19	10.7	...	7.5	-23	-17	-20	-29	...
20	11.2	-36	8.1	-18	-11	-14	-22	-33
21	13.2	-17	8.8	-13	-5	-6	-12	-21
22	16.0	-9	11.2	-15	-5	-4	-8	-14
23	14.9	-9	10.4	-11	-4	-4	-10	-18
24	13.9	-8	9.7	-7	-2	-5	-12	-23

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.3	11	20.6	7	14	15	11	6
2	26.1	11	21.7	5	14	15	12	7
3	26.6	11	22.5	4	13	15	12	8
4	26.6	11	22.3	5	14	15	13	8
5	26.5	11	21.9	7	15	16	13	8
6	26.0	12	21.3	10	17	17	13	8
7	25.1	13	20.3	15	19	18	13	6
8	23.4	15	18.7	22	22	18	11	3
9	21.2	19	16.8	33	26	19	8	-4
10	19.0	20	15.0	33	23	13	0	-16
11	16.8	22	13.3	30	17	4	-13	-33
12	15.1	23	12.0	26	10	-6	-27	...
13	14.1	24	11.2	23	4	-13	-37	...
14	13.4	24	10.6	21	0	-19	...	...
15	12.9	24	10.2	18	-4	-24	...	...
16	12.6	25	9.9	17	-6	-28	...	...
17	12.4	25	9.6	15	-8	-31	...	...
18	11.7	25	9.0	11	-15	-39	...	...
19	10.8	26	8.3	5	-24	...	...	...
20	11.1	25	8.4	7	-21	...	...	...
21	13.5	24	10.2	21	0	-19	...	...
22	17.8	13	13.7	18	13	5	-7	-23
23	21.8	12	17.1	14	16	13	6	-3
24	24.3	11	19.4	10	16	15	10	4

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.3	9	22.7	-9	6	11	12	11
2	29.5	12	23.4	1	13	16	15	13
3	27.1	14	21.5	12	18	19	17	12
4	24.9	17	19.8	21	23	21	17	10
5	23.8	20	18.8	30	28	24	17	10
6	22.9	22	18.1	36	31	26	18	9
7	22.0	23	17.5	38	31	25	16	6
8	20.7	24	16.2	38	30	23	12	1
9	18.7	25	14.7	36	26	17	4	-9
10	16.6	26	13.1	33	21	10	-4	-21
11	15.4	27	12.1	31	18	5	-11	-30
12	14.6	28	11.5	29	15	1	-17	-37
13	14.0	27	11.1	27	12	-1	-20	...
14	13.7	23	10.7	22	9	-3	-21	...
15	13.4	17	10.4	16	6	-5	-22	...
16	12.8	8	9.8	9	2	-8	-23	...
17	12.0	0	9.1	3	-1	-10	-25	...
18	12.5	-4	9.4	0	-1	-8	-20	-36
19	15.0	-2	11.8	-4	1	-2	-10	-21
20	19.7	2	15.0	-10	1	3	0	-6
21	24.3	5	18.9	-16	0	4	5	2
22	27.4	6	21.8	-19	-1	5	7	5
23	28.8	7	23.4	-19	0	6	8	7
24	29.8	8	24.7	-16	2	8	10	9

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.7	18	11.3	19	10	0	-15	-32
2	14.0	10	10.7	10	5	-3	-17	-34
3	17.5	7	13.8	4	7	4	-4	-14
4	23.5	8	18.1	-2	7	9	7	1
5	27.7	7	21.0	-8	6	9	10	7
6	27.9	7	23.3	-11	4	8	9	6
7	27.8	7	23.0	-12	3	8	8	6
8	27.4	7	22.5	-12	3	8	8	6
9	26.5	7	21.5	-9	5	8	8	5
10	24.8	8	19.9	-3	7	9	7	3
11	22.6	9	19.1	4	10	10	6	0
12	20.4	11	16.2	12	14	10	3	-6
13	18.2	14	14.5	18	15	8	-2	-14
14	16.5	18	13.1	22	14	5	-9	-25
15	15.5	23	12.3	26	14	2	-14	-33
16	14.8	24	11.7	26	12	-1	-19	...
17	14.2	26	11.3	26	11	-4	-24	...
18	13.8	27	10.8	25	9	-6	-27	...
19	13.5	27	10.5	24	7	-9	-31	...
20	12.6	28	9.8	21	3	-15	-39	...
21	11.6	29	8.9	17	-4	-24	...	...
22	11.7	29	9.0	18	-3	-23	...	...
23	14.3	26	11.3	27	11	-3	-24	...
24	15.1	24	11.6	27	15	3	-13	-31

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.9	5	9.6	5	4	-2	-13	-27
2	13.4	9	9.3	9	4	-4	-17	-33
3	13.0	13	9.2	12	4	-5	-21	-39
4	12.5	16	8.9	14	3	-8	-26	...
5	12.1	23	8.7	18	3	-12	-33	...
6	12.6	22	9.2	18	5	-8	-27	...
7	14.3	22	10.6	22	11	0	-15	-33
8	16.9	20	12.8	25	18	10	-2	-15
9	17.1	17	11.9	20	15	8	-3	-16
10	15.2	12	10.5	12	8	1	-10	-24
11	14.0	6	9.6	6	4	-3	-14	-28
12	13.1	0	9.0	1	0	-5	-16	-30
13	12.5	-7	8.8	-2	-1	-6	-16	-29
14	12.1	-12	8.4	-5	-2	-6	-15	-27
15	11.7	-17	8.2	-6	-2	-5	-14	-25
16	11.2	-28	8.0	-12	-7	-10	-19	-31
17	10.8	...	7.8	-19	-14	-17	-27	...
18	11.4	-34	8.3	-16	-10	-12	-21	-33
19	13.4	-15	9.1	-11	-3	-4	-9	-18
20	16.8	-6	12.4	-16	-4	-2	-5	-11
21	18.4	-2	12.8	-15	-2	0	-2	-7
22	16.7	-3	11.6	-10	-1	0	-4	-11
23	15.5	-1	10.7	-4	1	0	-7	-16
24	14.5	1	10.0	1	3	-1	-10	-22

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.8	22	9.0	16	1	-14	-36	...
2	12.8	18	9.7	16	5	-7	-25	...
3	15.8	15	12.5	16	12	4	-7	-22
4	21.8	13	16.9	13	16	14	8	0
5	26.2	10	20.5	8	15	15	12	6
6	27.3	9	22.3	4	13	14	12	7
7	27.2	8	22.5	2	12	13	11	6
8	26.7	8	21.8	2	11	13	11	6
9	25.6	9	20.7	4	12	13	10	4
10	23.9	10	19.1	8	13	13	8	2
11	21.6	12	18.4	13	15	12	6	-2
12	19.3	14	15.2	18	16	10	1	-10
13	17.0	17	13.4	21	15	7	-5	-20
14	15.1	21	11.9	23	13	2	-14	-32
15	14.0	25	11.1	25	11	-2	-21	...
16	13.2	27	10.4	24	8	-7	-28	...
17	12.7	29	10.0	23	6	-10	-32	...
18	12.4	30	9.7	23	5	-12	-35	...
19	12.1	30	9.4	22	3	-14	-38	...
20	11.6	31	8.9	20	0	-18	...	...
21	11.0	32	8.4	18	-3	-23	...	...
22	11.5	31	8.7	20	0	-19	...	...
23	12.3	31	9.4	23	5	-12	-35	...
24	11.5	30	8.8	19	0	-18	...	...

VK WEST Sth PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.9	11	22.6	13	19	19	16	10
2	28.9	11	23.9	13	19	20	17	12
3	29.4	11	22.0	14	20	20	17	13
4	29.3	12	24.6	16	22	21	18	13
5	29.1	12	24.1	20	24	23	19	14
6	28.5	14	23.1	27	28	26	21	14
7	26.3	17	20.9	34	32	27	20	12
8	23.9	20	19.0	39	33	26	18	8
9	21.4	23	16.9	39	31	23	12	0
10	18.9	25	14.9	37	27	18	5	-9
11	16.9	27	13.3	35	23	12	-3	-20
12	15.7	29	12.4	34	20	8	-9	-28
13	14.9	29	11.7	32	17	4	-14	-34
14	14.1	30	11.2	30	14	0	-19	...
15	13.6	31	10.8	28	12	-3	-24	...
16	13.4	31	10.4	28	11	-4	-25	...
17	12.8	32	9.8	27	10	-6	-28	...
18	12.2	33	9.3	24	6	-11	-35	...
19	11.8	31	9.0	22	3	-15	...	...
20	12.3	24	9.3	19	4	-11	-33	...
21	14.7	19	11.6	20	11	1	-15	-33
22	19.2	16	14.7	20	17	12	2	-9
23	23.5	13	18.3	17	19	17	11	3
24	26.5	12	21.1	15	19	19	14	8

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.0	12	12.2	12	10	4	-6	-18
2	15.2	5	11.6	3	5	0	-8	-20
3	19.0	5	15.0	-4	4	4	0	-6
4	25.5	7	19.6	-12	3	7	7	5
5	29.5	7	24.1	-18	0	6	9	8
6	29.3	6	24.3	-20	-1	5	8	7
7	28.8	6	23.6	-19	0	5	8	7
8	27.7	6	22.4	-16	1	6	8	6
9	25.8	7	20.6	-10	4	8	8	4
10	23.3	8	18.4	-2	7	9	7	1
11	20.7	9	16.4	4	10	9	4	-3
12	18.3	12	14.4	11	12	7	-1	-11
13	16.3	15	12.8	17	12	4	-7	-22
14	15.1	19	11.9	21	12	1	-14	-31
15	14.2	24	11.2	24	11	-2	-20	...
16	13.7	26	10.8	24	9	-5	-25	...
17	13.4	27	10.5	24	8	-6	-27	...
18	13.1	28	10.2	24	7	-8	-30	...
19	12.5	29	9.6	22	4	-13	-36	...
20	11.9	29	9.1	19	0	-18	...	...
21	12.4	29	9.4	21	3	-14	-38	...
22	14.8	26	11.1	28	15	1	-16	-38
23	15.6	24	12.0	27	17	7	-7	-24
24	18.6	19	14.4	23	20	14	4	-7

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.6	13	22.9	15	21	21	18	13
2	29.3	13	23.8	12	19	20	18	14
3	30.2	13	25.0	10	19	20	19	15
4	30.6	13	23.7	10	19	21	19	16
5	31.0	14	25.8	10	19	21	20	17
6	31.5	13	26.0	12	21	22	21	17
7	31.3	14	25.6	16	23	24	22	18
8	30.4	15	24.7	21	26	25	22	18
9	28.7	16	23.1	28	29	27	22	16
10	26.6	18	22.4	37	33	29	22	14
11	24.5	19	19.5	39	33	27	18	8
12	22.2	20	17.7	38	31	23	12	0
13	20.5	21	16.3	38	28	19	6	-8
14	19.5	22	15.4	38	26	16	1	-14
15	18.6	22	14.8	36	24	13	-2	-19
16	17.8	22	14.2	35	21	9	-7	-26
17	16.9	23	13.3	33	18	5	-13	-34
18	16.3	23	12.7	31	15	1	-18	...
19	15.0	24	11.7	27	9	-7	-30	...
20	13.3	24	10.3	20	-1	-22	...	...
21	12.9	25	9.9	18	-4	-26	...	...
22	16.0	20	12.6	26	12	-1	-20	...
23	21.7	15	16.9	23	21	16	7	-3
24	26.5	14	20.9	19	22	21	16	10

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.4	8	23.1	-20	0	6	9	8
2	26.9	10	21.4	-12	4	9	11	9
3	24.6	11	19.5	-3	9	12	11	7
4	22.4	13	17.8	5	13	14	11	5
5	21.2	16	16.8	14	18	16	11	4
6	20.3	19	16.1	22	22	18	11	2
7	19.5	23	15.5	29	25	19	10	0
8	18.5	26	14.5	35	27	20	9	-3
9	17.8	28	13.8	36	27	18	6	-7
10	16.4	30	12.7	35	25	15	1	-14
11	15.0	31	11.5	33	21	10	-6	-23
12	15.2	31	11.6	34	22	10	-5	-22
13	15.1	29	12.0	32	19	7	-9	-27
14	14.4	26	11.3	26	15	3	-13	-31
15	13.9	20	11.0	20	11	0	-15	-33
16	13.7	14	10.7	14	8	0	-15	-31
17	13.4	8	10.4	8	5	-1	-14	-29
18	12.8	0	9.9	3	2	-3	-15	-30
19	12.0	-7	9.2	0	0	-5	-16	-31
20	12.4	-10	9.4	-3	0	-4	-13	-25
21	15.1	-5	11.9	-8	0	0	-6	-14
22	19.8	1	15.2	-16	-1	2	1	-3
23	24.3	5	19.0	-22	-3	3	5	3
24	27.2	7	21.7	-23	-2	4	7	6

Silent Keys

Due to increasing space demands, obituaries should be no longer than 200 words.

The WIA regrets the passing of :

R E	Palmer	VK2KRP
R A J (Roy)	Taylor	VK2TR
B (Basil)	Rogers	VK3ABJ
H (Henry)	Denver	VK3AHQ
G L (Godfrey)	Barthold	VK3BT
E C (Ed)	Graham	VK3JAA
B A (Tiny)	Wendt	VK4ATI
C W (Wally)	Mann	VK5DF
G B (Geoffrey)	Widnall	VK6GZ
H J	Griffiths	VK6HB
E T	Potter	VK6ZO
H H	Fietz	VK7HH

Brian Alfred (Tiny) Wendt VK4ATI, JP

It's with much sadness that we advise of the sudden passing of the "gentle giant" of packet radio in Queensland, "Tiny" Wendt.

Most of Brian's early professional career was involved in photography, commencing during his service with the RAAF. He saw service in several areas of Australia, but most notably in PNG and Bougainville. Here he became very interested in aerial surveying and cadastral work and, after discharge, worked in private enterprise for several years, particularly as lab manager at QASCO.

It was here that Tiny became exposed to amateur radio, and set about gaining his novice, followed shortly afterwards by his full licence. He was elected Divisional Councillor in 1981.

In the early 1980s he heard of packet, and that John VK4KJB had the only TNC in VK4. He obtained a GLB PK80 TNC, and linked John with Graham Ratcliff VK5AGR on 21MHz. He then assisted Chris VK4BCM in developing packet for VIC-20s. The work done by Brian and Chris became the basis of the digipeater network so widely used today.

This led to the purchase of some 300bps telephone modems, and with John Bews, the establishment of AMPAK, the first telephone BBS which could be linked into the packet network. Today AMPAK has a subscriber base of several thousand. He also experimented with the use of a phone BBS on packet.

Remember that these were very early days in the development of personal computers, and even small steps forward took many months. His slow and steady pace was relentless in achievement.

All during this time, he was involved, through his work at Sunmap, in the development of the Queensland Pavilion at Expo '88 as its technical manager. The contribution he made to the success of the Queensland Pavilion was recognised through awarding him the British Empire Medal for services to VK4.

After Expo '88, he established the Sunmap Bulletin Board and managed the Sunmap Technology Centre. This BB is one of the largest in VK, and is respected around the world. It was awarded a National Award for Technology in Government.

Our most sincere condolences to his daughter Lee-Ann.

Vale Tiny Wendt VK4ATI.

David Jones VK4OF and friends

L A Maschette VK6KWN

Amateur radio has lost a "character'. Alyn Maschette, born at Harvey WA in 1932, worked (and played) in two or three states, served in the RAAF, had a number of callsigns (at least one of which he claimed to have invented!), loved life, and was generous to a fault. Westlakes Radio Club knew him; so too did WA groups such as VHF, repeater and digital clubs. He loved the hobby and seemed never to tire of promoting it. His other love was Rostrum, and appropriately enough, he loved and stoutly defended the English language. Indeed Alyn would pick a (verbal) fight with anyone or anybody (corporate or otherwise) if he thought someone was doing somebody else wrong!

In spite of severe health problems over recent years, Alyn never let go of his love of life and family.

His battle ended, however, at 1am on Monday 8/2/93 in Royal Perth Hospital when the last and most severe of a series of heart attacks called QRT for VK6 "kind, wise and nice".

Harry Atkinson VK6WZ
5/97 Railway Parade
Mt Lawley WA 6050

Roy Taylor VK2TR, 1926-1993

Roy was born in Cremorne NSW. He attended Marconi School of Wireless where he sat for his first class, second class and broadcast licences. He also obtained his licence as a commercial radio operator in 1944.

Roy worked for several radio stations in NSW and Queensland, including Kempsey, Mackay and Ayr. He also worked for the Flying Boat Air Radio Base at Karumba. After leaving Karumba he worked for 4VL Charleville, where he met Billie, who was on a working holiday with her brother. Roy and Billie were married in Melbourne in 1948.

Roy's love of radio, in particular broadcasting, led him to a position in Bega with 2BE (now 2EC) in 1949, where he stayed until 1951. For the next 12 years Roy and his family lived in Papua New Guinea where he operated radio circuits and coastal radio for the Department of Posts and Telegraphs. Returning to Australia in 1963, Roy worked for 2BE for 10 years before moving to Cooma (2XL) until his retirement.

Roy passed on his interest in amateur radio to his son Steve VK2EDH, daughter Mandy VK2MFG, and son-in-law Kevin VK2NBW.

Roy passed away peacefully on 1 February 1993 after a short illness. Sadly missed by us all.

Billie Taylor

Godfrey Lewis Barthold VK3BT

Godfrey Barthold, one of the early amateur broadcasters, died on 22 February 1993, aged 93.

He was educated at Caulfield Grammar School and went on to study accountancy. He qualified in 1924.

By that time, Godfrey had become interested in radio through his friend the late Keith Ballantyne (VK3AKB) and together they formed the Radio Equipment and Service Company.

Godfrey obtained his amateur station licence 3GL in 1925, and was soon on the air broadcasting speech and music when the commercial stations were off the air on Sundays. His many signal reports attest to the high standard of his transmissions.

In 1927 Keith sold his interest in the Company to Godfrey.

Godfrey's callsign was changed to 3BT and 3GL was allocated to a Geelong commercial station.

In 1933 Godfrey married Miss Jessie McKenzie and they built a house in Glen Iris.

The Company's post war production included original parts for VW and other vehicles.

After the war, things were different radio-wise.

Denied the opportunity to broadcast, Godfrey used his equipment mainly as a means of keeping in touch with his radio friends.

Godfrey was a member of the WIA and the Radio Amateur Old Timer's Club.

He was predeceased by his wife: he leaves two daughters, one son, eight grandchildren, and many great grandchildren.

Godfrey will be sadly missed.

Dudley Cutler VK3ZDC

Editors Note: Last month, several lines from the Obituary in respect of Harry Hocking were inadvertently omitted, and the entire Obituary is now published below. We extend our apologies to the authors, and in particular to Harry's family ... VK3ABP.

Harry Hocking VK2HH

It is with regret we record the passing of Harry Hocking VK2HH on 9 December 1992 at the Calvary Hospital, Kogarah, after a short and sudden illness, at the age of 72 years.

Harry trained at the Marconi School of Wireless in Sydney, then made his career as a professional radio officer. First serving a few years in the Merchant Marine in WWII before being appointed by Qantas as an RO, flying first in Catalina then Sunderland flying boats.

He continued this career through various Qantas aircraft until the use of radio officers was discontinued with the advent of the 747.

Harry continued on ground-based training duties, but with many interesting flights to evaluate new radio systems.

When QANTAS initiated the first Jumbo 747 passenger trips to Antarctica, Harry was again "air-borne" and the call "VK2HH Aeronautical Mobile/Antarctica" brought responses from many joyful DXers.

Retirement in 1980 ended 36 years with QANTAS and allowed Harry to develop his many overseas contacts with whom he could have, in his words, "A good chin-wag".

He will be sadly missed from our skeds, and we pass our condolences to his XYL, Jean.

George VK2UN
Bill VK4WMG/2JJ
Alf VK2GVT
Ben VK2AJE
ar

Over to You

Restoration of Beaufort A9-557

Jack White, curator of aircraft at the War Museum, Canberra is restoring A9-557, a Beaufort which flew with 100 Squadron. It crash landed at TADJI (Aitape) in late 1944 (no brakes, no flaps as a result of enemy action over Boram air strip — Wewak area).

Jack would appreciate donations of any parts salvaged, "won" or otherwise acquired from the interior of any Australian made Beaufort (700 of them were made).

In particular he requires radio (AT5-AR8, ATU, Genemotors and Cables and Plugs) and radar units (ASV — transmitter/receiver/display unit, S-O-H switch), IFF set, DF loop controls, plugs and cables, voltage regulators and other wall furniture from the W'op's compartment, Navigator's instrument panel, bomb distributor fusing switches, drift recorder, Astro Compass, 02 or 06 compass, flame floats, aluminium sea markers, "R3003 only" and so on ad infinitum.

There must be lots of bowerbirds who, unlike me, haven't disposed of gadgetry because of multiple job-related shifts.

Could you please direct a plea for amateurs and others to search through their junk boxes to root out these now valuable bits and pieces, and send them to:

Mr Jack White
Curator of Aircraft
Australian War Museum
Canberra ACT.

Alan Gardner VK4BWG
40 Wattle Avenue
Bribie Island Q 4507

EMI and Telephones

The article in WIA News (March 1993) concerning EMI and telephones raises important issues, and not just for amateurs.

While working for ABC radio I am reminded of a call I received from a listener living at St Albans (Melbourne). Unfortunately our listener just happened to live "cross the road" from 3LO, 3RN and 3PB transmitting station !

The caller phoned us in desperation — can you help us eliminate the 3LO signal from our telephone ? She explained that Telecom had checked her phone and was told nothing could be done. Reluctantly, I had to explain that the fault is with the phone system. (Her sons didn't mind — they could pick up the phone when the cricket was on and get the score).

It seems that many "technical type" people, and not just in Telecom, haven't a clue when it comes to RF. Let's hope that engineers within Telecom with EMI experience point out the radio frequency facts of life to their managers.

And while on this topic may I tell a tale about ABC Radio in Melbourne?

Readers may recall the ABCs Picnics in the Park — our big PR day.

Well Melbourne had theirs on March 7th.

As part of the display a temporary FM station was set up in the gardens. Guess what happened?

An outside broadcast mixer — a special, all singing, all dancing, state-of-the-art unit, designed for us, suffered severe EMI from the Tx on 94.1 MHz, AND IT WAS ONLY 5 WATTS! You would think we would have required EMF rejection as part of the design specs — after all it was to be used by a *RADIO STATION!*

Dallas James VK3AMU
13 McKay Street
Essendon Vic 3042
ar

WICEN

News from WICEN (NSW) Inc

The now-annual Co-ordinators' Meeting will be held at Goulburn Police Academy on the weekend of 15-16 May, and all WICEN personnel are invited to attend for a nominal fee.

All WICEN personnel are reminded that the only postal contact with WICEN (NSW) Inc is PO Box 123, St Leonards 2065; all other addresses are "null and void".

WICEN (NSW) conducts nets at various times; the most prominent are the Sydney VHF Net every Thursday night at 2130 on repeater 7150 (in Chatswood), and a statewide HF net every Tuesday night on 3.615 MHz at 2030.

Dave Horsfall VK2KFU, Publicity Officer, WICEN (NSW) Inc
ar

Stolen Equipment

One Kenwood TM221A 2M FM transceiver, serial number 8022576.

GME TX472S, 40 channel UHF transceiver, serial number 006-62229.

Owner Gerald Q Badcock VK7GQ, RSD 740, Exton 7303. Tel (003) 62 2328. Police contact: Const Mick Coull, Carrick Police. (003) 93 6112. No distinguishing features on either sets. Equipment was stolen from radio shack on 15/2/93 at the above address.

Stolen from VK3KCs property at Clunes (nr Ballarat Vic)

Sharp Tape recorder.

Slow Scan mono TV system housed in a grey steel box 15"x15"x4". This was a 110/12v commercial SSTV surveilance system, a ROBOT clone, modified for amateur use.

B and W Video camera, marked "VK3KC" on both sides.

Large Zoom lens "C" mount.

240/110v transformer PSU.

7" mono monitor, 110/12v.

Microphone.

Folders on operation of Robot 400 and Acitron xcvr circuitry.

Hills XG-14 TV antenna.

Details to K I Codlin VK3KC RMD 4601 Moe South Road, Moe South 3825 ar

"YL station here. Name is Ermintrude. Won a beauty contest today. First prize was an FT1000 and a three element beam".

CONTESTS

*Peter Nesbit VK3APN **

Contest Calendar Apr-Jun 93

Apr 1	Poisson d'Avril	(Mar 93)
Apr 3/4	SP DX	(Mar 93)
Apr 9/11	Japan DX CW	(Mar 93)
Apr 10/11	"King of Spain"	(Mar 93)
Apr 17/18	SARTG AMTOR	(Mar 93)
Apr 24/25	Helvetia (Swiss) CW/SSB	(Apr 93)
May 1/2	ARI (Italy) CW/SSB/RTTY	(Apr 93)
May 8/9	CQ-M (Russia)	(Apr 93)
May 29/30	CQ WPX CW	(Mar 93)
Jun 5/6	RSGB Field Day CW	
Jun 12/13	ANARTS (VK) RTTY	
Jun 26/27	ARRL Field Day	

One of the problems experienced each month by your columnist is the difficulty of fitting all the rules of relevant contests, together with results, into the space available. Whilst attempting to perform this herculean task, it has become evident that most contests share similar rules, to the extent that a set of general rules and definitions for HF contests has now been identified and written.

These will undoubtedly evolve further. They are however a start, and hopefully contest organisers in this and other countries can be encouraged to move towards the adoption of standard rules and definitions, without sacrificing the "flavour" of their particular contest.

The advantage to entrants is that they will know more precisely what is required of them, both in contest operation and log submission, and that their entries will be treated fairly and penalties avoided.

The General Rules and Definitions will be presented at least once a year, and I suggest you copy them for easy reference over the ensuing months. They should be read in conjunction with the rules for overseas contests, which from now on will be more heavily abbreviated in this column to conserve space and enable other information of interest to appear.

Your comments are invited. Until next month, good contesting!

73

Peter VK3APN

General Rules & Definitions for HF Contests

The following information applies mainly (but not exclusively) to HF contests, and has been obtained from the rules for ARRL, RSGB, CQ, and WIA contests. It should be read in conjunction with the rules published in AR for specific contests, and unless stated otherwise in the rules for those contests, can be assumed to apply.

Dates

Most contests are held on the same full weekend of the month each year.

Times

The larger DX contests occupy 48 hours, usually commencing at 0000z on the first day and finishing at 2400z on the second day. Most other contests run for less than 48 hours, with starting and finishing times chosen to suit the host country.

Rest Periods

Some contests specify a maximum operating period, and require the operator to take (usually 2) rest periods. In such instances, the rest periods must be at least 15 minutes each. *Listening time counts as operating time.* To prevent operators operating for the full contest period and later selecting the most profitable operational period, any evidence of contest contacts being made during a rest period, even though such contacts may not appear in the log, will result in disqualification. Rest periods only apply if stated.

Bands

Unless otherwise stated, HF contests will use 1.8-30 MHz, except 10, 18 & 24 MHz. Some contests limit operation to certain segments of the band (eg for CW, the bottom 25 or 30 kHz, novice contacts excepted). Crossband contacts are not permitted, although contacts between stations using different parts of the same band are permitted. Except for single band contests, most contests provide separate categories for multiband and single band entries.

Band Changes

In some contests, to prevent rapid band hopping which may become tantamount to multi-transmitter operation, once a transmitter has begun operating on a particular band, it must not change band until at least 10 minutes has elapsed (sometimes called the "10 Minute Rule"). This rule only applies if stated.

Modes

Unless otherwise stated it can be assumed that both phone and CW contacts are allowed, but crossmode contacts are not.

Categories

Only single operator entries will be accepted unless otherwise stated. Single operator stations are where one person performs all operating, logging, and spotting functions. Some contests call this "single operator unassisted".

If any assistance is received from spotting nets or other alerting systems not physically located at the station, including telephone, the operator must enter the all band single operator assisted category (if allowed for the particular contest), or failing that, the multi-operator category.

Multi-operator stations are where more than one person operates, checks for duplicates, keeps the log, etc. In this category, some contests also distinguish between single transmitter and multi-transmitter stations ("multi-single" and "multi-multi" respectively). Single transmitter stations are where only one signal is transmitted at any one time. Two transmitter stations are where two signals are transmitted at any one time. Unlimited stations are where a maximum of one signal per band is transmitted. In the multi-operator category, once a transmitter has begun operating on a band, it must not change band until the time specified in the "Band Changes" rule has elapsed. Listening time counts as operating time.

Multi-transmitter stations must have all operating equipment including antennas located within a 500m diameter circle or the property limits of the licensee's address, whichever is greater. All antennas must be physically connected by wires to the station transmitters and receivers, precluding the use of remote receiving facilities (except for spotting nets or other alerting systems, if allowed by the rules).

Unless otherwise certified on the summary sheet, an entry from a club, group, or organisation will be considered multi-operator by default.

Power

Some contests provide categories for output power, which are commonly 5W (QRP), 100W ("low" power), and unrestricted. Power categories apply only if stated.

Portable Stations

A station entering the portable category of a contest must use portable field equipment operating from a power source which is independent of any permanent facilities, eg batteries, portable generator, solar power, wind power. All equipment and antennas comprising a portable station must be located within a 300m diameter circle. None of the portable field equipment may be erected on the site earlier than 24 hours before the beginning of the contest. Entrants must operate from the same site for the whole of the contest. The portable category is available only if stated.

Receiving stations

Most contests will also accept SWL entries. Rules are generally as for transmitting stations, except that SWL logs must show the callsign of the station heard, a signal report on that station, the number sent by that station, and the callsign of the station being worked.

Callsign

A single operator may only use a callsign of which he/she is the official holder. A single operator may not use a callsign belonging to any group, club or organisation for which he/she is a member or sponsor except as part of a multi-operator entry. A multi-operator station may use only one callsign during the contest.

Solicitation of Contacts

The use of non-amateur radio means of soliciting contacts, such as telephone, is precluded. Amateur repeaters may be used to arrange a contest contact on another frequency, providing the repeater is not used for that contact. If a contact is solicited with a station who has no other contest contacts, to guard against it being disallowed as an unconfirmed contact, note in the log that it was solicited.

Contest Exchange

Unless otherwise stated, use the standard contest exchange which is RS(T) plus a 3 digit number starting at 001 and incrementing by 1 for each contact. If 999 is reached, continue to 000, then to 001 etc. Multi-transmitter stations must use separate numbers for each band starting at 001. To avoid confusion when simultaneously operating in two or more contests on the same band, it is generally acceptable to use the same set of serial numbers for both contests.

Stations in the country hosting the contest will often add a 2 or 3 letter suffix to the number indicating their county or province. In such cases, the suffix must also be copied correctly to allow full points to be claimed for the contact.

Countries and Continents

Countries are as per the ARRL DXCC list at the time of the contest, and continents as per the boundaries defined for the WAC award. Continental boundaries are shown on the "Radio Amateurs Prefix Map" published by Callbook Magazine (available through WIA). Some DX contests allow contacts with stations in one's own country for multiplier credit, but such contacts usually have zero point value. The rules will state the actual scoring method.

Multipliers

The multiplier on each band is usually the total of one or more of the following: total number of countries worked, total number of zones worked, total number of county or province codes worked. The final score then equals (total QSO points from all bands) x (multiplier from band 1 + multiplier from band 2 + ... multiplier from band n). With single band entries, obviously only one band applies. The rules will state the actual method of calculating the multiplier and final score.

Bonuses

Some contests, mainly those sponsored by the RSGB, use bonus points instead of multipliers. In this case the bonuses are derived similarly to multipliers, but are added to the QSO points, not multiplied. The rules will state the actual method of calculating the bonuses and final score.

Information Shown in Logs

Logs must show dates and times in UTC (GMT), bands, callsigns, complete exchanges sent and received, and QSO points. Incomplete contacts must be logged with zero points claimed. Points are not lost if a non-competing station does not send appropriate information, providing the report and any other exchange is logged. An additional column must be included to show multipliers/bonuses wherever they contribute to the final score. Multi-operator stations must submit separate logs for each band.

Log Cheeking

Duplicate contacts must be logged with zero points claimed. Logs must also be checked for correct points and multipliers/bonuses.

Check Log

Entries with more than a certain number of contacts, (eg 80 or more for RSGB contests), must include a sorted alphanumeric list of calls (ie a "dupe" sheet) for each band. RSGB contests also require either the serial number sent or the time of contact to be included beside the callsign, plus a sorted list of multipliers or bonuses for each band.

Summary Sheet

Include a summary sheet showing the callsign used during the contest, name, mailing address, location of the station during the contest (if different to the mailing address), section (ie multiband or band used, single or multi-operator, power category if applicable etc), scoring information, and the declaration "I hereby certify that all contest rules and radio regulations were observed during the contest" with signature and date. Single band entries showing more than one band may be judged as multiband unless otherwise specified. For multi-operator entries, the summary sheet must also list the callsigns, names and signatures of all station operators.

Equipment details, plus interesting anecdotes, comments on the contest, and/or a photograph are also often invited.

Log Submission

Logs, including check logs, may be submitted either on paper, or on 3-1/2 or 5-1/4 DOS disk in a standard contest format (eg K1EA "CT" amongst others). Some contests also accept disk logs in ASCII, and common database, spreadsheet and word processor formats (check the rules). Logs submitted on disk must include a summary sheet on paper. Paper log sheets should each be headed with Contest Name, Band, Callsign, and Page x of n.

For the large contests, the inclusion of a self addressed label for the return of an award (if received) is often appreciated by the organisers. Logs are generally retained by the organisers. Indicate CW or SSB on the envelope.

The standards for logs submitted on disk will be addressed in a future column.

Deadline

To ensure that the log arrives by the specified deadline, it is advisable to send it airmail, as late logs are usually classed as check logs.

Awards

At the judges' discretion, trophies, plaques, and certificates will be awarded to the highest scoring stations in the various categories and countries. Where returns justify, 2nd, 3rd, or more awards may also be made. In some contests, to be eligible for awards, stations may need to show a certain minimum score or period of operation.

Penalties and Disqualification

Score reduction may occur for taking credit for duplicate contacts, unconfirmed QSOs and multipliers, and scoring discrepancies. Depending on the contest and the problem, penalties may range up to 15 times the QSO points.

Logs will be disqualified if duplicate contacts contribute more than 2% to the score; "rubber clocking" is detected (ie altering the recorded time so that actual operating time exceeds the allowable limit); or changing bands more rapidly than allowed (if applicable).

At the judges' discretion points may be deducted or entries disqualified for illegible or excessively untidy logs, absence of a summary sheet, breaching the rules or spirit of the contest, or evidence of single operator stations receiving significant logistic support from clubs or groups.

Disqualified stations may be banned from further participation in the contest for up to 3 years.

Any station may be approached, without notice to entrants, for confirmation of a contact.

Rule Changes

The rules for overseas contests are often not received until after the AR publishing deadline. In these instances, it usually safe to use the rules from the previous year, as changes from one year to the next are generally minimal. See also the "DATE" section above.

Helvetia Contest (Switzerland) CW/SSB

When: 1300z Saturday to 13z Sunday, Apr 24/25
This is a good opportunity to pick up extra Cantons for the Helvetia Award, which requires confirmation of all 26 Cantons. General rules apply (see above). Work only Swiss stations. You may work a station only once per band, regardless of mode. Score 3 points per QSO, multiplier is total Cantons. Send log postmarked by 31 May to: USKA Traffic Manager, Walter Schmutz HB9AGA, Gantrischweg 1, CH-3114 Oberwichtrach, Switzerland.

ARI International DX Contest CW/SSB/RTTY

When: 2000z Saturday to 13z Sunday, May 1/2
This is a world wide contest, and occurs each year on the first full weekend of May. Anyone can work anyone else. General rules apply (see above). Categories are: Single operator CW, SSB, mixed, and RTTY; Multi operator single transmitter mixed; and SWL mixed. The same station can be contacted on the same band once each on CW, SSB, and RTTY, but the multiplier can be claimed only once for that band. Once a band or mode has been used, 10 minutes must elapse before it can be changed. Send RS(T) + serial number, Italian stations will send RS(T) + province.

Score 10 points per Italian QSO, 3 points per QSO with stations in another continent, 1 point per QSO with stations in own continent, and zero points per QSO with stations in own country.

Multipliers are the sum of Italian provinces (max 95) and countries (excluding I and IS0) on each band. Province codes are: I1: AL AT CN GE IM NO SP SV TO VC; IX1: AO; 12: BG BS CO CR MI MN PV SO VA; I3: BL PD RO TV VE VR VI; IN3: BZ TN; IV3: GO PN TS UD; 14: BO FE FO MO PR PC RA RE; I5: AR FI GR LI LU MS PI PT SI; I6: AN AP AQ CH MC PS PE TE; I7: BA BR FG LE MT TA; I8: AV BN CB CE CZ CS IS NA PZ RC SA; IT9: CL CT EN ME PA RG SR TP AG; I0: FR LT PG RI ROMA TR VT; IS0: CA NU SS OR.

A check log is required for 100 QSOs or more. Send log postmarked by 1 June to: ARI Contest Manager I2UIY, PO Box 14, 27043 BRONI (PV), Italy. An updated MS-DOS logging program for this contest is also available by sending US$5 or 10 IRCs to the same address. You type the callsign and number received, and it calculates the points, multiplier, and score; prints the log, check log, and summary sheet; and prints QSL labels. It can be used real time or after the contest.

CW-M Contest

When: May 8/9 (?)

In past years, this interesting contest has stimulated considerable activity throughout what used to be the USSR. It is normally scheduled for the second weekend of May, however rules for the past 2 years have not been seen, and following the breakup of the USSR I am not sure if it still even runs. I suggest you listen for U- and R- stations giving contest numbers, and if any are heard, join in! The Baltic republics (YL, LY and ES), having left the old USSR, are probably no longer workable by VKs for credit in this contest. Logs used to go to Box 88 Moscow.

Ross Hull Contest 1992-1993

John Martin (VK3KWA) Ross Hull Contest Manager

Four further Ross Hull logs have been received. Thanks to the entrants for sending these in even though they were a little late! I will publish any further scores received up to the end of March.

Call	Name	6 m	2 m	70 cm	23 cm	13 cm	3 cm	Total
VK5NC	T Niven	14	1768	973	60		16	2831
VK5KAF	J Kemp		2120					2120
VK7KAP	A Perkins	2	396	448	120			966
VK4KZR	R Preston		528	161	160			869

VHF — UHF Field Day 1993

John Martin (VK3KWA)
VHF/UHF Field Day Contest Manager

Nothing went right with the Field Day this year. The rules should have been published in December rather than January, and deliveries of the January magazine were chaotic. Propagation crashed just before the Field Day, as did the weather in some areas — one hilltop station reported significant flooding of the tents! Nevertheless some notable contacts were made and much fun was had.

Most logs were extremely well presented, although some were hard work because they did not include an overall scoring table. As with the Ross Hull Contest, corrections have resulted in scores being increased.

Due to the late delivery of January "AR", I have extended the deadline for logs and will publish the scores of any logs I receive by the end of March. However I do not expect that any late logs will change the order of placegetters, so here are the results as they stand!

Results

The main prize this year has gone to Rob Ashlin, VK3DEM, for an excellent effort in his first VHF-UHF Field Day. The runner-up is Phil Helbig, VK5AKK. In the new six-hour section, first place goes to Doug Friend, VK4OE. In the multi-operator section, competition has increased but the Geelong Amateur Radio Club has regained the top place. The top scoring home station was Des Clarke, VK3CY. Congratulations to all.

Call	Name	6 m	2 m	70 cm	23 cm	Total
Section A — Single Operator, 24 Hours						
VK3DEM	R Ashlin		5220	3024	140	8384
VK5AKK	P Helbig	174	2928	2772	300	6174
VK3AFW	R Cook		1044	504	30	1578
VK4OE	D Friend	20	768	189	240	1217
VK68K	A Petch		288			288
VK6JRL	R Lamb		288			288
VK6NEB	E Zimmerman		288			288
VK4KZR	R Preston		220		60	280
VK68WI	P Parker		152			152
Section B — Single Operator, 6 Hours						
VK4OE	O Friend	20	288	105	240	649
VK68K	A Petch		288			288
VK6JRL	R Lamb		288			288
VK4KZR	R Preston		160		60	220
VK5ZTJ	T Lowe	56	104	14		174
VK68WI	P Parker		152			152
Section C — Multiple Operator						
VK3ATL	(1)	410	5600	4543		10553
VK1DO	(2)	108	584	2520	330	8762
VK5BW	(3)	400	3168	1134	220	4922

Section D — Home Station

VK3CY	D Clarke		2068	840		2908
VK5NY	R Bowman	60	700	714	156	1630
VK3AUI	G Sones	7	496	399	40	942
VK5LP	E Jamieson	3	40	35	30	226
VK2NJ	I Thomas		84	7		91

(1) Geelong Amateur Radio Club: M Trickett VK3ASQ, K Asplin VK3DQW, B Abley VK3YXK, C Leone VK3BCL, L DeVries VK3PK, C Gnaccarini VK3BRZ, A Gnaccarini VK3TU.
(2) C Davis VK1DQ, G Rozenberg VK1CQ, P Tams VK2CJ.
(3) A Raftery VK5BW, A Russell VK5ZUC, J Brayley VK5AJQ, T Denton (SWL).

Next Year

The comments and suggestions made by entrants were studied carefully and are much appreciated. I have tried to keep the rules simple, but there have been some requests for changes and clarifications, which I will do my best to put into effect next year.

One definition requested is that of a portable station. I would suggest:

"A station is portable if the equipment, including antennas, has been transported and set up at a location other than the home station(s) of the operator(s)."

The rules could be simplified by dropping the ban on crossband contacts, and allowing operation from more than one locator square an entrant could then try two different locations on the two days. To dovetail better with the six-hour section, repeat contacts could be allowed after three hours rather than four. There is also support for a later finish on the Sunday.

There were some comments about the different scoring systems for the Ross Hull Contest and the Field Day. The rules could only be brought completely into line by using distance-based scoring for the Field Day — no major problem — and not allowing repeat contacts (which would be a problem).

Using locators for the Field Day simplifies the scoring and provides an opportunity to collect squares for the Grid Square Award. On the other hand, most people have no trouble estimating distances from a map, but many do not know what their locator is and do not care how many locators they work. I will give more thought to this and would appreciate any further comments.

There is still strong support for running the Field Day at the end of the Ross Hull Contest, so next year's dates should be the same as this year's.

* *Federal Contest Coordinator*
24 Sovereign Way, Avondale Heights, 3034

ar

WIA FEDERAL 1992 ANNUAL REPORTS

FEDERAL PRESIDENT

OVERVIEW

The year just completed has been both busy and financially successful for the WIA. Major events and activities included WARC92, sole provision of the amateur radio examination service and considerable progress towards finalising new regulations with DOTC. During the year a changed management structure was implemented with the introduction of a WIA board of Directors and work has started on revising the Articles of Association.

FEDERAL MATTERS

Federal office

To a large extent the year in the Federal Office has been one of consolidation. As you will see from the financial statements the General Manager and the Office staff are to be congratulated on their prudent management of our funds with a performance which exceeded budget planning.

The WIA Examination Service has now completed a full year and better information is available on its profitability. During the year statistics on examination events and papers per event allowed a review of pricing; which was based upon a greater number of candidates attending a lesser number of examinations. It appears the scheme is now "too convenient", leading to greater overhead costs per examination event. As a consequence and in order to recover over a reasonable period of time, members" subscription funds used to finance the scheme, examination event prices were increased from October. Some concerns were expressed over these increases however indications from candidates suggest they are not unduly concerned with the changes. We gain the impression a number of candidates are still regularly "having a go" rather than preparing themselves properly to gain a pass.

During the past year the General Manager's work load has remained high and he has provided a considerable voluntary contribution to the work of the Federal Office. This workload must be addressed by the new Board with some urgency.

Membership Statistics

Information supplied by DOTC on licences issued by them show a 2% decrease to an end of year total of 18166. Unfortunately our membership figures have shown a much greater trend with a loss of 6.7% to an end of year figure of 6334. Examining the detailed statistics further shows full call members are proportionately higher than the licence figures, novices and limited calls considerably lower and combined calls roughly on line. Other concerns are the loss of members through non renewal after one, two or three years membership. Finally the year past was severe on older members with an apparently larger number of silent keys. With an ageing population trend nationwide, we need to devote considerable attention to recruiting new members.

Federal Executive

As required by the existing Articles of Association, a Federal Executive was elected at last year's Federal Convention. Only the seven Federal Councillors were appointed to that Executive. Council also resolved to re-arrange the management structure of the WIA so that Executive, which is formally named in the Articles, would only meet for ASC prescribed actions. In June the Executive met and effectively passed its management responsibilities to the WIA Board of Directors, who are the seven Federal Councillors acting with full company director's powers and responsibilities. The Board, to discharge its fiduciary duties to the ASC, also monitors the operations of the WIA to ensure policies are applied, objectives met and financial viability maintained.

WIA Board of Directors

The Board of Directors, with its representatives from each Division, has met each quarter since June. The Board has discharged its management responsibilities whilst remaining responsive to the Divisions through the views of the Federal Councillors. Obviously this is an interim arrangement until the Articles are re-written to reflect the new structure.

Articles of Association

To formalise the management structure used during 1992 the [Council] adopted a series of Regulations under Article 103. These Regulations have provided guidance in the revision of the Articles of Association, last formally rewritten in 1974. Changes in company law, brought about by ASC requirements have also been included. It is our intention not to rush this revision, never-the-less we plan to have them adopted well before the end of 1993.

Corporate Planning

As reported last year most of the activities identified in the Corporate Plan have been achieved, or relate to issues outside of the responsibility of the Federal body. The next step has been to develop clear, yet broad Policy Statements and Annual Objective Statements.

Several years ago the Federal Council adopted a series of Policy Statements on a wide ranging series of topics. In the year just past the Board has revisited those Statements and produced several new ones. There are now some 13 up to date Policy Statements which provide guidance to Divisions, Federal councillors, Board members, the General Manager and WIA officers on WIA agreed policy. These are progressively being published in the columns of AR magazine to inform amateurs of their contents. Naturally Policy Statements are dynamic expressions and can be revised at any time.

Objectives are set in advance to aid the budget formulation; they indicate known likely areas of activity during the coming year. These are also published in AR magazine for members information.

Amateur Radio magazine

Amateur Radio magazine has, in my personal opinion, occupied a disproportionate amount of the Board's time during the past year. I feel that situation is now over with a definitive Policy Statement on AR magazine nearing adoption.

The Board has agreed the magazine is the WIA's house journal, it needs to cater for the wide ranging interest groups within our hobby, as well as convey information to members and serve as a journal of record for posterity. In all not an easy task to pull all this together with principally volunteer contributors, part time editorial staff and budgetary constraints.

It is proposed to concentrate effort on further enhancing the presentation or appearance of the magazine and continue production in an economic manner. A wide range of production options will be examined in 1993 to see what they have to offer for our type of journal and size of production run.

INTERNATIONAL MATTERS

WARC92 Involvement

It was seen timely to report the WIA's involvement in WARC92 in considerable detail at last year's Federal Convention and in the columns of AR magazine.

Ongoing Commitments

The WIA continues to be involved in ITU and IARU related matters. Periodic meetings are attended at which the Australian position on changes to the ITU is examined and developed. Indications suggest no specific amateur representation will be required at WRCs (the successors to WARCs) for a few years, although the IARU could very well be involved.

Next year IARU Region III meets in Singapore. The WIA will shortly be starting its preparations for that meeting, including considering whether to nominate for the position of Region III Secretary.

DOTC MATTERS

New Regulations

Arising from initiatives by DOTC at last years Federal Convention, the WIA compiled a series of recommended changes to the amateur regulations expressed principally in RIB71. The opportunity was taken to obtain inputs from packet users, repeater

users and FTAC before negotiations were commenced with DOTC. What appeared to be an essentially completed exercise, following with the Minister's speech read at SEANET92, has now become a long and drawn out affair with no set completion date in sight due to the new Radcom Act 1992, setting up of a Spectrum Management Agency by DOTC and the April 93 elections.

SMA

The Radcom Act 1992 sets up a Spectrum Management Agency to carry out the duties currently done by DOTC's Radiocommunications Division. Amateur radio remains managed by regulation and some early WIA approaches to determine whether its administration will be offered for tender have met with the reply that it is too soon to provide an answer. Never-the-less this is a possibility the WIA should remain aware of.

Incomplete Actions

The hiatus created by the Radcom Act, the SMA and other changes in DOTC has contributed to a substantial backlog of WIA actions with the Department. Many of these are related to reciprocal licensing agreements and third party traffic arrangements with other nations, which by their nature are usually long and drawn out processes.

STANDARDS

WIA involvement in standards has expanded to three fronts, namely Standards Australia, AUSTEL and DOTC. The last two are emerging activities, with the first being an ongoing commitment.

AUSTEL, in its setting of telephone and associated equipment standards, is of emerging importance, not only for connection to the public network through phone patch terminals, but also through immunity standards for domestic telephones. An overseas radio magazine recently described the modern phone as an RF transparent plastic cased collection of diodes and multi band antennas!

The Radcom Act 1992 empowers DOTC with setting equipment standards for radio frequency apparatus. Obviously it is in the amateurs best interests to avoid type approval or sealed equipment. The WIA's position is amateur equipment should meet reasonable performance and safety characteristics, for amateurs" personal safety and security from interference complaints.

THANKS

I wish to record my personal thanks and also the thanks of the WIA to the following:
Our General Manager/Secretary, Bill Roper VK3ARZ and his loyal hard working office staff.

My fellow Board members, Rob Apathy VK1KRA, who also doubled as Vice President, Roger Harrison VK2ZTB, Peter Maclellan VK3BWD, Murray Kelly VK4AOK, Bill Wardrop VK5AWM, Neil Penfold VK6NE and Jim Forsyth VK7FJ.

Our Federal Coordinators and Officers, whose efforts are truly appreciated:

AMSAT	Graham Ratcliff	VK5AGR
Awards	John Kelleher	VK3DP
Contest Manager	Peter Nesbit	VK3APN
Education	Brenda Edmonds	VK3KT
EMC	Hans Ruckert	VK2AOU
FTAC	John Martin	VK3KWA
Historian	John Edmonds	VK3AFU
Honorary Legal Counsel	George Brzostowski	VK1GB
IARU	Kevin Olds	VK1OK
Int'l Travel Host Exch	Ash Nallawalla	VK3CIT
Intruder Watch	Gordon Loveday	VK4KAL
Media	Roger Harrison	VK2ZTB
QSL Manager(VK0,9)	Neil Penfold	VK6NE
Standards	Roger Harrison	VK2ZTB
Videotapes	John Ingham	VK5KG
WARC & CCIR	David Wardlaw	VK3ADW
WICEN	Leigh Baker	VK3TP

Ron Henderson VK1RH
Federal President

IARU REGION III

This report covers largely the period from the 1992 Federal Convention to the end of the year as I did not take up office until the 1992 Federal Convention. 1991 had been the year of the IARU Region III meeting in Bandung, Indonesia, and my predecessor in this job, Ron Henderson VK1RH, had completed all outstanding matters from that meeting prior to my taking office. This has meant that the year since the 1992 Convention has been rather a quiet one.

On the Region III front, few new matters have arisen. Major matters continuing from the Region III meeting have been the Promotion of Amateur Radio Committee established at the Region III meeting and the establishment of a Region III Amateur Radio Direction Finding Competition. The first running of this competition is due in 1993. Through its representatives, the WIA is involved in both these groups.

Although 1992 has been a quiet year, 1993 can be expected to become busier as we begin to gear up for the 1994 IARU Region III meeting.

On the international front, 1992 saw the holding of WARC 92 in Spain. The WIA was ably represented by David Wardlaw VK3ADW and Ron Henderson VK1RH,as part of the Australian delegation. Many thanks to both for their efforts. As was reported from that WARC, future WARCs will be held more often to consider a narrower agenda. It is thus vital that the amateur fraternity maintain its representation on the International front.

Recommendation

Given the increasing demands being placed on the WIA which require international representation, the International Representation Levy component of WIA subscriptions be maintained.

Kevin Olds VK1OK
IARU Liaison Officer

FINANCIAL

As a non-profit organisation, the WIA should always budget for an excess of income over expenditure of about 5% of income. Expenditure for fixed assets (equipment, etc.) can only be made from Accumulated Reserves.

The 1992 budget for the Federal WIA was constructed for a surplus of income over expenditure of $19,550 or 4.5% of budgeted income.

Income for the year was $10,134 more than expected, and expenses were tightly controlled resulting in savings of $13,460 better than expected. The resulting surplus of income over expenditure of $43,144, or 9.7% of gross income, boosted Accumulated Reserves to a healthy $119,408.

The International Representation provision balance, included in the Accumulated Reserves, stands at $19,013.

Bill Roper, VK3ARZ
General Manager & Secretary

PROFIT AND LOSS BUDGET AND ACTUAL AMOUNTS FOR 1992

INCOME	BUDGET	ACTUAL	VARIATION Amount	%	1991 ACTUAL
ADVERTISING (incl. HAMADS) – AR	40000	47318	7318	18.3	45860
CALL BOOK	32000	23698	-8302	-25.9	32412
DONATIONS	0	18	18	0.0	0
EXAMINATIONS INCOME	24000	40712	16712	69.6	5619
INSERTS – AR	600	442	-158	-26.3	603
INTEREST RECEIVED	14100	12433	-1667	-11.8	17373
INTERNATIONAL DONATIONS/LEVIES	12560	12708	128	1.0	19060
MAGPUBS	2900	3151	251	8.6	2943
MEMBERS SUBSCRIPTIONS	295800	292995	-2605	-0.9	305477
SUBSCRIPTIONS (OVSEAS DIRECT) – AR	5500	5352	-148	-2.7	5473
SUNDRY INCOME	2500	1414	-1086	-43.5	2859
TEAC FEE INCOME	4000	3674	-326	-8.2	4676
TOTAL – INCOME	433780	443914	10134	2.3	442353
LESS EXPENDITURE					
AMSAT	2000	0	2000	100.0	2072
AUDIT FEE	3000	3000	0	0.0	3306
AWARDS – AR	500	312	168	37.6	504
AWARDS & SPECIAL PROJECTS	750	1602	-852	-113.6	353
BAD DEBTS WRITTEN OFF	500	0	500	100.0	0
BANK CHARGES	2500	2351	149	5.9	2204
BULK POSTS – AR	40000	38575	1425	3.6	38955
CALL BOOK EXPENSES	13000	8206	4794	36.9	12928
COMMITTEE/COORDINATOR EXPENSES	1200	1741	-541	-45.1	2644
CONVENTION EXPENSES	22000	18276	3724	16.9	18322
DOTC LIAISON	1200	580	620	51.6	1227
DEPRECIATION	7900	8384	-484	-6.1	6907
DRAFTING – AR	1000	620	380	38.0	490
ELECTRICITY	1700	1469	231	13.6	1610
EXAMINATIONS EXPENSES	4800	9339	-4539	-94.6	3388
GENERAL EXPENSES/SUNDRIES	1000	2092	-1092	-109.2	2010
I.A.R.U. DUES	5000	4849	151	3.0	4488
INSURANCE/WORKCARE LEVY	5500	5677	-177	-3.2	5253
INTERNATIONAL REPRESENT'N PROVISION	12580	12708	-128	-1.0	19060
LONG SERVICE LEAVE PROVISION	0	1960	-1960	0.0	0
MAGPUBS EXPENSES	3900	4456	-556	-14.2	3943
POSTAGES & FREIGHT	10000	9938	62	0.6	9987
PRINTING – AR	57000	57073	-73	-0.1	55214
PRINTING/STATIONERY/OFFICE SUPPLIES	10000	6482	3518	35.2	10413
PROMOTION/ADVERTISING/RECRUITING	4600	2441	2159	46.9	5582
RENT & CLEANING	11600	11930	-330	-2.8	9664
REPAIRS & MAINTENANCE (OFFICE)	1500	1749	-249	-16.6	4180
SALARIES & SECRETARIAL	145000	147507	-2507	-1.7	148317
TEAC EXPENSES	2000	880	1120	56.0	2320
TELEPHONE	3500	4022	-522	-14.9	3918
TRAVEL – AR	0	0	0	0.0	0
TRAVEL (BOARD)	2000	79	1922	96.1	674
TRAVEL (OFFICE)	500	416	84	16.9	966
TYPESETTING – AR	25000	22100	2900	11.6	25354
WRAPPING & ADDRESSING – AR	11500	9956	1544	13.4	10860
TOTAL – EXPENSES	414230	400770	13460	3.2	417114
SURPLUS/DEFICIT	19550	43144	23594	120.7	25239

PUBLICATIONS COMMITTEE

This report has been compiled mainly from the material on record in the minutes of the Publications Committee for the 12 monthly meetings of 1992. The year seemed to split naturally into two halves, the predominant feature of the first half being the number (usually a dozen or more) of typographic and layout errors in each issue. There was a great improvement from August on. One issue had as little as three errors! This was brought about almost solely by the supply of material to the typesetters on floppy disks. Any errors detected at a proof-reading (of which there were usually three) could thus be eliminated.

This use of disk transfer was made possible by a change of typesetters. Unfortunately the previous typesetters (Magazine Graphics) were not equipped for disk input, but our printers (Industrial Printing) could also handle typesetting from disk and have been performing both functions since July. Three benefits have accrued from the change. Firstly, we have a much closer control over every word of input. Secondly, there are many less typographical errors since they cannot be introduced after proofing. Thirdly, because the process is more automated it actually costs less, and even in six months has saved some thousands of dollars.

There were several administrative changes during the year. Most significant was the decision of the 1992 Federal Convention to disband Executive and place most of its functions under the direct control of the Federal Secretary, who thus became the Publisher (among many other things!). The Editor also lost the "Executive" prefix. The Managing Editor (Graham Thornton, VK3IY) resigned for personal reasons as from the end of June, and was replaced by Bruce Bathols VK3UV under the title "Production Editor". I would like here to place on record my sincere thanks to Graham for his three years of service to "Amateur Radio" magazine, during which he so effectively directed production at a time when no other appropriately skilled person was available. He has not severed all ties with AR, but is still one of the proof-reading team, which also includes Allan Doble VK3AMD, Jim Payne VK3AZT, and John Tutton VK3ZC. The eight members of the Publications Committee itself are still the same as listed for 1991 (see April 1992, page 23).

The financial results for the year were very close to budget. Income was $53,000 ($7,000 over budget), expenditure $225,000 ($15,000 under), membership contribution $174,000, and cost per copy mailed to each member $2.42 (vs budgeted $2.56). As for 1991, Bill Roper must be congratulated on the accuracy of his budget.

Once again I would like to thank all concerned with the publication of AR for their co-operation. To the members for their contributions (particularly the regular columnists), the Committee and the Technical Editors, the proof-readers, the typesetters/printers, the Publisher and the Federal Office staff, the mailing house and any other helpers still unlisted, my deepest gratitude! May we do even better in 1993!

Bill Rice VK3ABP
Editor

FEDERAL TECHNICAL ADVISORY COMMITTEE (FTAC)

The past year has been fairly quiet — hence this brief report — but worthwhile progress has been made, especially in the area of consultation regarding our new licence conditions.

Membership and Activities

The following members of the liaison panel resigned during the past year: David Lyddieth, VK1AR; Bob Allan, VK5BJA; and Glenn Thurston, VK6ZGT. The new members of the liaison panel are Ian Cowan, VK1BG;

Garry Herden, VK5ZK; and Joe Nevin, VK6ZTN. Thanks to those retiring members for their help, and thanks also to the new members for taking on the job.

The major activities for the past year have been:

1. Maintenance and updating of the beacon and repeater Data Base;
2. Consultation and drafting of recommendations for deregulation of licence conditions (especially relating to repeater linking and packet radio identification);
3. Consultation on frequencies for beacons, links and repeaters;
4. Processing of record claims.

Problems and Concerns

1. Responses from some Divisions, and communication from the federal Board to FTAC, have been disappointing.
2. The inoperative condition of many beacons is still a matter of concern, as it was a year ago.
3. Increasing pressure for the use of MDS frequencies for pay TV poses a potentially serious threat to the 2.3 GHz amateur band.
4. Some revisions to the band plans are needed, largely as a result of new privileges for Novice and Combined licensees, and also to make provision for new techniques such as digital store and forward, linear translators etc. It is proposed to circulate a set of recommendations to all Divisions during the next few weeks.

Conclusions and Recommendations

1. Members of the FTAC panel should be commended for their assistance in the consultative process leading up to the adoption of our new licence conditions.
2. It is recommended that the Board take urgent action in an attempt to prevent the possible loss of spectrum in the 2.3 — 2.4 GHz range with the introduction of microwave pay TV.
3. Divisions are again urged to review the operating condition and frequency allocation of beacons.

John Martin (VK3KWA)
Chairman, FTAC

Help protect our frequencies — become an intruder watcher today.

STANDARDS

While there was little activity in relation to Standards during 1992, there was one event of significance to amateur radio during the year. This was the introduction of standards covering a wide range of electronic and electrical appliances and equipment which can either cause, or suffer from, RF interference.

Standards Australia issued new joint Australian and New Zealand standards in October covering EMI and EMC relating to appliances. A complete set of these has been purchased by the Federal Office and are held in the library there.

RF immunity levels for TV and broadcast receivers is covered by one of these new standards, while others cover the unwanted RF energy (RFI) generated by VCRs, TV and sound broadcast receivers, computers and other information technology equipment, vehicle ignition systems and power tools.

The standards of particular interest are:

AS/NZS 1053, on interference caused by TV and sound broadcast receivers;

AS/NZS 2557, on interference from various types of engines;

AS/NZS 3548, on RF interference from IT (computer) equipment;

AS/NZS 4053, on RF immunity of TV and sound broadcast receivers.

The issuing of these new standards is an important preliminary to revisions currently under way to the Radiocommunications Act 1983. When originally drafted, provision for such electromagnetic compatibility (EMC) standards was included in the Act, but Australian governments to date have been reluctant to make mandatory standards, perhaps under pressure from manufacturers and Importers.

The move to issuing regional standards was foreshadowed, in part, in my report for 1991.

It now seems such EMC standards will become a technological imperative for consumer goods in Australia, long after wide adoption in Europe.

Roger Harrison VK2ZTB
Standards Co-ordinator

WICEN

When I took on the task of being National Co-ordinator for WICEN I agreed to do it for a limited period of Three years. That period of time has now come to an end. I chose this period of time because I felt that it needed at least that long to get over the inertia of the past and to start the Divisions to siarl seeing all of the Divisional WICEN issues as part of a larger National scene. My concerns in this regard were correct and while many things have certainly been accomplished by the Divisions over the last three years, I feel that many of them still see themselves as small and isolated fishes in a large and muddy pool. I have not changed my belief that this does not need to be the case.

Many of the Divisions are still struggling through the mire of self determination, desperate for more members to become involved with exercises. This is so that they can raise enough money to administer themselves or to get the essential capital equipment to provide the basis for an effective state-wide network. All of this is necessary but I personally believe that few WICEN administrators take the time to plan enough in advance to foresee where they want their Division to go.

There needs to be a really strong centralised base of amateurs willing to do community events, so that WICEN can develop an effective administrative and capital equipment base, or alternatively funding is going to be required from other sources. WICEN also needs to develop a strong sense of teamwork and belonging for its members.

WICEN MUST also cater for the needs of the amateur living in an isolated community who, simply because he lives in a place where a disaster may happen and emergency communications be required, needs to be able to quickly and easily integrate into the formal emergency network. WICEN, put simply, should be the co-ordinating factor or catalyst for the average amateur to access response and recovery agencies in emergencies.

If you look deep into the past amateur responses in the realty large disasters, WICEN has simply had some "first in teams" and then assumed the co-ordinating role for other volunteers from the general amateur movement. There is NO WICEN Division which will have enough members or resources available to cope with a major disaster without help from the rest of the amateur fraternity. To this end I believe that when such a response is required, WICEN will be flooded with offers of assistance. WICEN must ensure that it has the administration necessary to cope with the tasks placed upon it and to look after the people working for it at these times.

United into an effective National organisation WICEN will be well received by both State and Federal agencies. Many of the disaster agencies in the smaller Divisions are well aware of the potential resource available to the community through WICEN and are patiently awaiting for WICEN in those Divisions to become more organised. We are well received by many such agencies now!

As part of the National structure we must standardise operations, procedures and administration as much as possible given the diverse organisational structure of WICEN in the Divisions and the differing structures in the various disaster plans. There are three Divisions that are Incorporated and two of these also have charity status. Other Divisions are still looking at Incorporation. In some Divisions the lines of communication between WICEN and the WIA need to be vastly improved. All of these issues and the fact that we are all volunteers with limited time and money make it difficult to standardise in all things, but we must do so as far as we are able as quickly as possible.

It has been a year of internal turmoil for several Divisions as they have gone through periods of review and restructure. The results of these should now start to start up in improved communications and internal administration in the next few months. Thanks to David VK3UR in his backstop role to me and also, with Paul VK3PW, for the distribution of both public and administrative WICEN information around Australia via WICENs ever expanding Information Network (I must confess that I cannot understand why the WIA Divisions and Federal Board do not use a similar network).

I would like to thank Trevor Connell VK8CO for his efforts to get a standardised WICEN Training Manual off the ground, and to Brian Mennis VK4XS for his various packet rally scoring systems. I would also like to thank the Divisional WICEN Co-ordinators for putting up with my reams of mail and general "interference" in the running of their Divisions. I trust that they saw my comments as constructive and intended to co-ordinate rather than just plain old interfering.

Thanks to all WICEN Members for your efforts and support.

Leigh Baker VK3TP
National WICEN Co-ordinator

CONTESTS

The past year has seen the retirement of Neil Penfold VK6NE as Federal Contest Coordinator, and Frank Beech VK7BC as VK/ZL/Oceania DX Contest Manager. Both gentlemen have contributed significantly to WIA contest administration over the years, and on behalf of WIA members I would like to thank them sincerely for their services. Action is now in hand to find a new manager for the VK/ZL/Oceania DX Contest, which will take place as usual later this year.

The WIA contest managers are now:

John Martin VK3KWA:	Ross Hull & VHF/UHF Field Day
Phil Raynor VK1PJ:	John Moyle Field Day
Northern Corridor Radio Group VK6ANC:	RD Contest
Ray Milliken VK2SRM:	VK Novice
(vacant):	VK/ZL/Oceania DX

The coverage of contests in AR has been significantly expanded, and many letters received from members approving the new format. This expanded coverage will continue, and will include the results of overseas contests in which VKs have participated, where available.

To minimise the amount of space required in AR, overseas contest rules are now being abbreviated for publication, and will be supplemented by a set of "General Rules and Definitions" published approximately yearly. This exercise has revealed considerable scope for standardising many rules and definitions, and I intend to raise this issue with contest organisers both here and in the USA and UK. Standardisation promises worthwhile benefits for entrants, including better publicity (due to less space required to print the rules), the elimination of "grey areas" in the rules, common requirements for logs and check logs, and eventually, the ability to use a single computer logging program for all contests.

Discussions are currently being had with the WIA contest managers regarding computer logging programs, and a standard format for computer generated logs will be published in AR in due course. Unless there are good reasons to do otherwise, the format is likely to correspond to that currently emerging from the USA.

In closing, I would like to thank the WIA contest managers for their valued services, and WIA staff for their help.

Peter Nesbit, VK3APN
Federal Contest Coordinator

AWARDS

Achievements

1. With the assistance of the staff of the Federal Office, I have been able to reduce the TOTAL DXCC active files from seven to four active folios. This was done by personally transcribing ALL DXCC files on to new "Country Lists", and placing ALL active files on to a computer database. This simplified the overall action down to mere additions and subtractions.
2. Two DXCC standings lists have been published in AR, the latest being the most precise. I have promised publication of DXCC standings on a roughly six monthly basis. The DXCC Roll of Honour has been introduced. The low limit being nine countries below the total DXCC countries. When the Roll of Honour was introduced, the total DXCC countries were 323. With the addition of the Yugoslavia Republics, it is now 326, with further changes in the offering.
3. DXCC profiles of the leading amateurs, who have earned total DXCC countries has also been introduced. Comments received have been glowing.
4. The certificates for the Antarctic and Grid Square awards were also designed and printed. Several of each have been awarded.

Problems

There have been very few problems since the conversion of files, and whatever other troubles occurred, have been easily and efficiently handled by the Federal Office staff.

Conclusion and Recommendation

1992 can only be described as a successful year, through interest in Award activity, and the overall co-operation that I have experienced. With poor propagation conditions prevailing, I have been surprised by the activity in the Awards section. If I have made the applicants happy, then I am gratified, and I hope that this situation continues.

To engender more amateur activity in Australia, it is my intention to investigate the introduction of another award. I will be discussing this idea with my colleagues as to its viability. I refer to the VK Cities Award (VKCA). I invite comment in this regard.

John Kelleher VK3DP
Federal Awards Manager

VK9/0 QSL BUREAU

As many would have read in various magazines, QSL activities by the various organisations and operators have lately come under scrutiny.

Letters to the Editor, DX columns etc mostly contain complaints, explanations and long lists of OSL Managers. One publication now lists 45,600 world wide. Added to all this is the recently noted reticence of DXpeditions to use the bureau system. This has caused a list of VK9/0 operators to be initiated, and printed in various publications, who do not use the bureau. Before any callsign is published, an effort has been made to contact the operator. Some telephone calling found two VK0s and the rest of the VK9 and 0s were sent packets of cards with a request to contact the Bureau Manager and tell him what was to be done with the cards remaining in the bureau.

The returns have been most disappointing. Most have ignored the request, while one asked for his cards (approx 3 kg) to be sent to Germany post free.

Recent DXpeditions to Cocos and Christmas Islands have been approached on their arrival in Perth. They have co-operated, as well as the two from VK6.

One over-riding factor with DXpeditions now is that the operators want help in defraying the costs of the expedition, and look to the QSL activity to achieve some recompense. If a card is required, you are expected to pay for it. Bureau operations are becoming obsolete.

One case is worth mentioning as the worst case (depending on your point of view) as to the cost of a QSL card. To receive a card from F6FNU costs $2 US, which coupled to the cost of outgoing postage makes the card to a VK operator $4.

One of the problems facing all Bureaux is the disposal of unwanted cards. Some organisations return unclaimed cards, others destroy them. Postage costs coupled with a fee per card charged by some bureaux makes the return of cards from the VK9/0 Bureau an uneconomic exercise. Most operators of VK9/0 callsigns are not members of the WIA.

At the end of 1992 the VK9/0 Bureau was completely cleared of all QSL cards.

Neil Penfold VK6NE
VK9/0 QSL Bureau Manager

EDUCATION

The year 1992 was noteworthy as the year in which the WIA assumed full responsibility for the amateur examinations throughout Australia. As Education Co-ordinator I have watched the development and progress of this system very closely, and am pleased that at last the scheme which the WIA proposed in 1987 as preferable, if examination devolvement was inevitable, has become a reality. As a direct result of the foresight, planning and hard work invested in 1991, mainly by the General Manager, the examinations are running very smoothly with a surprisingly low complaint level.

The next step is the review and extension of the examination question banks, which began during 1992, and which I hope will be completed by the end of 1993. A small number of volunteers have been assisting with review of existing and proposed questions, including a few which have been identified on examination papers as poorly worded or open to alternative interpretation. The ultimate aim is to ensure that the theory banks are balanced, of appropriate standard, and of adequate size. At that point, I feel that the WIA should publish the question banks.

The question banks for the Regulations examinations are still a problem. It has been very disappointing that after all the work that was put into the revision of the DoTC regulations (RIB 71), the final version is unlikely to be released until July 1993. This has meant that the revision of the Regulations question bank cannot be completed. It has also meant that a number of potential amateurs, who have been given to understand that a code-free Novice licence is to become available, have grown tired of waiting. However, it has also, apparently, stimulated a number of Limited licensees to upgrade to the proposed Intermediate stage by passing 5 wpm Morse code, and so become eligible for added privileges when the new regulations are in force.

My activities as Education Co-ordinator have been reduced in 1992. I have had less direct contact with clubs and individuals, and have not managed to attend as many Conventions or Hamfests as in other years. In addition, I have reduced the Education Notes in Amateur Radio magazine to every second month rather than monthly, because of the pressure on the magazine for space.

I give notice to the Board that this is my 12th Annual Report, and that I feel it is time for some other volunteer to be groomed for this position. I would like to continue until the question banks are finalised and published, but I think by then it will be time to hand over.

I would like to thank a number of individuals who have helped me this year. It is not necessary to name them. I expect 1993 to be a very busy year, and am confident that those helpers will respond to requests for assistance once again.

Brenda M Edmonds VK3KT
WIA Federal Education Co-ordinator

AMSAT-AUSTRALIA

The number of Amateur Satellite operators has once again steadily increased during 1992, particularly in the area of the 9600 baud Packet Radio satellites (PACSATs), and to a lessor extent the 1200 baud PACSATs. There also has been a steady trickle of newcomers to Amateur Satellites who are more interested in using Amateur Satellites for CW or voice communications, and have found great satisfaction in using the Russian Low Earth Orbit Satellites like RS-10/11 and RS-12/13, and the highly elliptical orbit AMSAT-OSCAR-10 and AMSAT-OSCAR-13.

Since Maggie Iaquinto VK3CFI first made contact with Musa U2MIR, aboard the Soviet Space Station MIR in 1991, Maggie has continued to keep contact with each new crew aboard MIR, which has meant that many Australian Amateurs have subsequently had the opportunity to communicate with the Russian Cosmonauts, both on voice and Packet Radio.

AMSAT-OSCAR-21 (RS14) was launched on the 29th January 1991 and has been plagued with problems during 1991. However during 1992 the RUDAK Command Team have been very successful in activating the Digital Signal Processing Experiment, enabling an FM repeater in space with an input on 70cm and an output on 2m. This mode has generated an amazing amount of interest, and like MIR activities, has allowed Amateur Radio operators with FM only equipment to gain experience in using Amateur Radio satellites, without the need to purchase any extra equipment.

In 1992, Australian schools were once again given the opportunity to talk to the astronauts aboard the Space Shuttles carrying Amateur radio operators. Unlike the first experiments in 1991, where a number of Amateur Satellite operators provided the radio link, in 1992 a number of Amateur Satellite operators set up equipment at the schools to enable "live" contacts. During one contact, normal communications were lost between a NASA Ground Control Station and the Shuttle, and a backup link was provided by Andrew Keir VK4KIV, who was providing the equipment for a link for students and staff at the Queensland University of Technology. NASA and the Shuttle Amateur Radio Experiment (SAREX) coordinators, continue to schedule Australian school children contacts on all future Shuttle flights which have SAREX on board. Any school wishing to arrange a schedule contact on any future message can obtain a SAREX application form by sending an SASE to AMSAT-Australia, GPO Box 2141, Adelaide SA. As well as these activities all amateurs had the opportunity to work SAREX on board the Shuttle either on voice or Packet Radio.

In 1992, no Australian representative attended the Third Phase IIID Experimenters" meeting in Marburg, Germany, as the two projects originally proposed in 1991 failed to materialise. I do not plan to attend the 1993 meeting, but plan to attend the 1994 or 1995 meeting to be trained as a Command Station for this new generation of Amateur Radio Satellite, due for launch in mid-1996.

UoSAT-5 (OSCAR22) which was launched on the 17th July 1991, was intended to have only a limited-access (download only) Amateur Packet Radio store-and-forward package using 9600 baud AFSK. However, when the commercial HealthSat facilities on UO22 failed, it was decided to cease the shared Amateur Radio activities on UO-14 with VITA. UO22 was then commissioned for exclusive Amateur Radio operations, and HealthSat operations moved to UO-14. This turned out to be of considerable benefit to the Amateur Radio community as UO-22 had many more resources than did UO-14.

The success of UOSAT-OSCAR-22 and the MICROSATS-PACSAT-OSCAR16 (AMSAT-NA) and LUSAT-OSCAR-19 (AMSAT-Argentina) with their general-access Amateur Packet Radio store-and-forward packages continues to be responsible for the continued upsurge in Amateur Satellite activity. As mentioned in last year's report, these Packet Radio Satellites have seen the reduction in the amount of HF forwarding of Packet Radio messages due to the efforts of a number of Satellite Gateway stations, mainly Garry Herden VK5ZK, and Brian Beamish VK4BBS, being the two main providers of this service. The activity of the Satellite Gateways has seen some congestion in the activities of individual users of UO-22 and KITSAT-OSCAR-23(KO-23 another UoSAT built 9600 baud Packet Radio Satellite, built for and operated by Korea), but this is being self-regulated by users and the software developers. This has generated some very interesting statistics which I can supply if the Board thinks they may be of interest to WIA members.

Thanks must go to Bill Magnusson VK3JT who has continued to provide the material for the AMSAT-Australia column in "Amateur Radio" during 1992. This column has generated almost half of the 1000 plus mail items that I have received during 1992.

During 1992, AMSAT-OSCAR-13's apogee has been steadily progressing towards the equator providing much more access to the Southern Hemisphere stations. During 1993, AMSAT-OSCAR-13 will provide the widest international coverage of any Amateur Satellite with the exception of AMSAT-OSCAR-10 which still provides excellent communication even though the onboard computer failed in 1986. This should see an increase in the use of Amateur Satellites for world-wide voice communications.

To give the Federal Councillors some appreciation of the interest in the Amateur Satellite Service during 1992, AMSAT-Australia received just over 1200 items of correspondence (an increase of 20% on last year), requesting information on hardware, literature and of course tracking and software to use the PACSAT store-and-forward satellites. The AMSAT-Australia monthly NEWSLETTER has increased its total number of subscribers since it started production in April of 1985 from 700, to just over 700 in 1992.

Finally, I would like to thank the WIA for its continued support of the Amateur Satellite Service via the activities of AMSAT-Australia, and ask that the 1993 Federal Convention recommend that the WIA continue to support AMSAT-Australia financially at the present level.

Graham Ratcliffe
AMSAT-Australia National Coordinator

Have you advised the DoTC of your new address

FEDERAL TAPES

1992 was the 17th year of the practice of Federal News being provided on a recorded tape cassette for playing on Divisional weekly news broadcasts.

During those 17 years both Ron Fisher and I put in a lot of work (Ron concentrating on the technical production of the tapes, and me concentrating on the news scripts), and we had a lot of fun. We both like to think that we provided a much needed and appreciated service for the WIA.

However, at a meeting of the WIA Federal Board of Directors on 24th October 1992, the Board decided to discontinue the Federal Tapes and provide future WIANEWS to the Divisions in the form of news releases.

Ron and I would like to take this opportunity to thank those volunteer Divisional broadcast announcers and engineers who so ably assisted us in presenting the Federal Tapes over the 17 year period.

Bill Roper VK3ARZ

GENERAL MANAGER and SECRETARY

The Federal Office, apart from providing administrative and secretarial facilities for the Federal Council and the Federal Board of Directors, exists mainly as a secretariat for the WIA state Divisions to provide those member services, such as Amateur Radio magazine, Call Book, Customs certification, DoTC Liaison, examinations, membership database and fee processing, etc., which can be carried out more efficiently on behalf of the Divisions by a centralised office.

1992 was another year of continued development and further computerisation of administrative procedures so that the Federal Office could run more efficiently and effectively.

Amongst the more significant happenings during the year were the following:
Intensive and lengthy negotiations with the DoTC regarding the new licence conditions;
Production of the 1993 Australian Radio Amateur Call Book;
An enforced change in the method of production of Amateur Radio magazine;
Introduction of a more modern and efficient membership renewal form;
WIANEWS production moved offsite and the end of Federal Tapes; and
Trial of an alternative method of delivering Amateur Radio magazine to members.

Office staffing remained unchanged. The staff currently consists of:-

Full time paid employee			
General Manager	Bill Roper	VK3ARZ	60 hours pw
Part time paid employees			
Office Manager	Brenda Edmonds	VK3KT	20.5 hrs pw
Book Keeper	June Fox		25 hrs pw
Membership & Exams	Chris Russell	VK3LCR	30 hrs pw
Membership	Margaret Allen		18 hrs pw
Contractors			
Editor	Bill Rice	VK3ABP	6 hrs pw
Production Editor	Bruce Bathols	VK3UV	14 hrs pw
Membership computer maintenance	Earl Russell	VK3BER	1 hr pw
Volunteer workers			
Librarian	Ron Fisher	VK3OM	3 hrs pw

Bill Roper, VK3ARZ
General Manager & Secretary

ELECTRO MAGNETIC COMPATIBILITY (EMC)

EMC Reports and subjects dealt with.
1. Report June 1992
This report dealt with seven different EMC matters:
Fluorescent lamp radiation,
Underground testing facility,
BT telephones
Radiation from Early-Warning-System,
EMC statistics UK,
Passive infra-red sensors,
Cable TV on Channel 6 and EMC in Germany.
2. Report October 1992
New law on amateur radio in Germany. The Minister, who stated at the Friedrichshafen International Amateur Meeting that "Amateur radio may have to live with "QRP-QRPP" has now been replaced!

Wind profilers in the USA. Susceptible Alarm Systems and telephones.
3. Report January and February 1993
This summary report titled "Amateur Radio and Electromagnetic Compatibility" Parts 1 and 2 had been submitted on 23.1.1992, but the publication had to wait until there was enough space in "AR". This delay did not do any harm, because this report was summing up EMC problems and remedies which had already been published in "AR" several years ago in a number of "AR" issues. This summary was compiled for those readers who did not keep earlier "ARs" or who joined our ranks more recently.
4. Report submitted 17/12/1992
Telephone susceptibility in the USA. Powerline rf interference sniffer and power authority. European-Common-Market and EMC-Standards. Even watered down standards (compared with the German 3V/m immunity requirement) for TV, VCR, Computer and HiFi-gear, seem to be beneficial in this country, because my nearest neighbours and my own new TV set have sufficient and improved immunity, compared with our earlier owned TV-sets. If manufacturers wish to supply 300 or so millions of people of the EEC — and they cannot afford not to try so — they have to meet certain EMC standards, and we in VK-land hope to benefit as well from this development if we receive the same imported goods.
4.2. A "Research -Association-Radio" has been formed in Germany, comprising experts from science, commerce, government, radio-amateurs, the media, on rf-radiation and its influence on humans (if any), to counter the nonsense now sometimes published.

My own experience: the Electronic Component-Lab of the Rosenthal Insulator Co Ltd in northern Bavaria/Selb, of which I was in charge for 7 years (prior to my coming to VK2), was attached to the High-Voltage-Lab. This lab operated a 2.3 million volt DC pulse generator, and a 1.2 million volt 25 or 50 Hz motorgenerator and transformer. The sparks, of up to 8 m in length through an artificial rain curtain, were most spectacular, shaking the building as well. Not far away was the testbed for about 100 plate insulators running 110 kV. Nobody, female or male employees suffered any ill effects, nor the families who lived 50 m away, like mine, and most company directors.

Hans F Ruckert VK2AOU
Federal EMC Co-ordinator

WIA EXAM SERVICE

WIA Exam Service operated successfully during its first full calendar year of operation and received many plaudits from examiners and candidates.

The statistics for 1992 were:

Accredited Examiners registered at 31st December	438
Examination events conducted during the year	515
Candidates who sat for exams	2383
Average exam pass rate	53.68%
Average candidates sitting at each event	4.63
Average exam subjects sat at each event	7.81

Because exams were costed on the basis of a minimum of 20 exam subjects at each event, and the average was a low 7.81, the WIA had to reluctantly increase the cost of exams as from 1st October 1992. This increase appears to have had no effect on the number of candidates sitting for examinations, and has reassured the financial viability of the service being offered by the WIA to amateur examination candidates all over Australia, regardless of location.

Several instances of exam irregularities are being investigated by the DoTC and seven examiners have been suspended pending the outcome of the investigations.

Work is continuing on increasing the theory question banks to 1000 questions each, at which time, hopefully before 31st December 1993, the complete theory question banks will be published for the information of course instructors and candidates.

Bill Roper, VK3ARZ
General Manager & Secretary

WARC AND CCIR

Since WARC-92, which was reported on last year, there has been continuing activity on the ITU -CCIR front. This activity will have definite ramifications for the amateur service. There is the continuing issue of the restructuring of the ITU. In addition a number of special CCIR TASK GROUPS have been set up to deal with matters arising out of Resolutions and Recommendations carried at WARC-92. Several have a direct bearing on amateur frequencies.

RESTRUCTURING OF THE ITU

I will firstly deal with the restructuring of the ITU. At its Nice Plenipotentiary meeting the ITU set up a HIGH LEVEL COMMITTEE to recommend, on the basis of an in-depth review of the structure and functioning of the Union, measures to enable the ITU to respond effectively to the challenges of the changing telecommunication environment.

To this end the report of this Committee was published in April 1991 with 96 recommendations. The most significant were those concerned with the International Frequency Registration Board (IFRB), International Radio Consultative Committee (CCIR), the International Telegraph and Telephone Consultative Committee (CCITT)and the Bureaux of Telecommunications Development(BDT).

It was proposed that the IFRB be disbanded and its function be combined with the CCIR to form the RADIO COMMUNICATIONS SECTOR with a nine person part time RADIOCOMMUNICATIONS BOARD and a full time Director. The CCITT would become the Standardisation Sector which would also take over some of the standardisation work of the CCIR. Also a third sector involving the BDT the DEVELOPMENTAL SECTOR would be formed.

The amateur and amateur satellite service is to be covered by the RADIO COMMUNICATIONS SECTOR how ever there may be some matters covered by the Standardisation Sector that could have an affect on the amateur service.

ADDITIONAL PLENIPOTENTIARY CONFERENCE

Acting on the recommendations of the HLC a draft new Constitution and Convention for the ITU was produced, to be presented at the ADDITIONAL PLENIPOTENTIARY CONFERENCE for consideration.

In this draft there was one change from the old Convention of great significance to the IARU, which the IARU, as the International Organisation representing the amateur service, thought could have been made by an oversight. This change removed the ability of the Council of the ITU to exempt International Organisations from having to financially contribute to the ITU if participating in the Technical committee of a WRC (equivalent of the CCIR). This would have cost the IARU an extra $40,000 per year to do what it is presently doing with out cost.

As a member of the Australian Preparatory Group for the Additional Plenipotentiary Conference which was to agree to the new constitution and convention I obtained support from Australia for reversion to the original provisions of the convention.

This was accepted by the APP along with a number of other changes to the draft.

WORLD RADIO CONFERENCES

World Administrative Radio Conferences (WARC) now become World Radio Conferences (WRC). These Conferences will be held every two years,with the agenda set four years ahead. There is the provision for skipping a conference if it is thought necessary.

The regular nature of these conferences will throw a constant load on the representatives of the amateur service. The IARU is aware of this and is currently working on a strategy involving continuous vigilance to make the best use of our resources.

The CCIR work will continue through Radio communications Study Groups and Radiocommunications assemblies which will be held every two years.

The significance of these changes to the WIA is in our need to continue our involvement with the Australian Administrations work in the preparation for International Conferences. Also to continue to be a member of the appropriate CCIR Study Group.

Currently there is the ongoing involvement with Australian CCIR Study Group 8 and more particularly Australian Study Group 8/L which has on its agenda the amateur and amateur satellite services.

Internationally, Working Party 8/A of the CCIR deals with the Amateur and Amateur Satellite Service its question and the various reports arising.

Also of concern to the amateur service are two CCIR Task Groups firstly TG 8/2 looking at Wind Profiler Radars which could involve frequencies around 50 MHz and 450 MHz. And secondly TG 12/4 which is studying inter-service sharing between 1 and 3 GHz. Bearing in mind the results and resolutions of WARC-92.

I will be attending TG 12/4 on behalf of the IARU.

With the proposed introduction of new services in the UHF bands at WARC-92 extreme pressure has been put on the existing services including the amateur service and also the amateur satellite service.

Adequate representation at the appropriate CCIR meetings will be essential to put the position of the amateur services, as the unique nature of the service is not always appreciated by all other delegates.

The matter of harmonisation of the frequencies around 7 Mhz will be on the agenda for a future conference.

VOLUNTEER GROUP OF EXPERTS (VGE)

This group has been set the task of simplifying the ITU Radio Regulations. Discussions have taken place with the Australian representative on this group.

A matter of concern is the apparent invisibility of the amateur satellite service in the International Frequency Table in the bands between 144 MHz and 10 GHz. This is due to the fact that the amateur satellite service is there by virtue of a footnote to the Frequency Table No. 664 which appears in association with the 430-440 MHz band.

As the text of the footnote only appears once, it leads to difficulties in easily identifying the actual bands on which amateur satellite operation is allowed. It would be much more satisfactory if the Amateur satellite service actually appeared in the table.

IN CONCLUSION I RECOMMEND.

1: That the WIAs involvement with WARC (ITU Regulatory Conferences) matters and the CCIR should be maintained as an important factor in the defence of amateur radio

2: That the title be changed to International Regulatory and CCIR Coordinator. In the Future the CCIR may need to be changed to Radiocommunication Study Group

David Wardlaw VK3ADW.
WARC & CCIR Co-ordinator

REPORT OF THE INTERNATIONAL TRAVEL HOST EXCHANGE (ITHE)

The International Travel Host Exchange (ITHE) is a voluntary scheme administered by the American Radio Relay League (ARRL) wherein interested radio amateurs are able to meet or host fellow operators from other countries. This is a free service, which is promoted by the WIA to its members. You do not have to be on the list to contact those on it.

During 1992 only three enquiries were handled by this office; one by a local intending to travel overseas, and two by potential visitors. A visiting US amateur spent six months in the local area and another seemed to have planned his visit around ITHE participants all over Australia! There have been a few other direct contacts between participants.

The total Australian membership is 23 couples or individuals and we need some more names. Please send an SASE to the undersigned for more details:-

Ash Nallawalla VK3CIT
PO Box 539,
Werribee VIC 3030
(03) 741-9302 AH; (03) 742-4566 Fax

Ash Nallawalla VK3CIT
Federal ITHE Co-ordinator

ALARA REPORT

Throughout the year the Editor has maintained a high standard of production of the Newsletter, and using modern computer technology has improved and changed the layout of the Newsletter introducing photographs, adding to the overall appearance

Changes to the committee have been the Editor, now Dorothy VK2DDB, and the Publicity Officer, Robyn VK3ENX.

Various members assisted scouts and guides for JOTA and enjoyed it.

The ALARA Contest had the highest number of logs submitted for a number of years, good conditions no doubt being helpful. Club stations were permitted to participate on a trial basis. The Florence Mckenzie trophy was not won.

The method of mailing the Newsletter was changed from Registered Publication to ordinary letter mailing.

As several of our members now operate on Packet that system was used to publicise the ALARAMEET to be held in 1993.

One of our VK4 members worked the Shuttle. VK4 members have commenced a weekly net and the official ALARA net continues on a Monday night to provide a first contact and for friendly continuing contacts.

Bron Brown, VK3DYF
Secretary
ar

HAMADS

TRADE ADS

- AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.
- WEATHER FAX programs for IBM XT/ATs

  *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder.

  *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver.

  *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage.

  ONLY from M Delahuntly, 42 Villiers St, New Farm OLD 4005. Ph (07) 358 2785.

FOR SALE ACT

- YAESU FT227RB 2m xcvr, 10w, scanning memoriser, mic, FL2050 2m linear amp incl rx preamp, manuals, $300; YAESU FT 707 xcvr, 100w, WARC, digital freq, FP107E 240vac/13.5vdc PSU, $700; Ron VK1WP (062) 54 9842, lic amateurs only.

FOR SALE NSW

- COLLINS KWM2A, COLLINS ... xvrs, brand new SH... new DIAM... 0w du... ...ers in quite su... ...together $2000; Charles VK... (02) 665 4767.
- YAESU FT107M S/N 1H100145 fully featured all SS base station, memory system fitted, inbuilt AC PSU, WARC bands, hand and desk mic, $800; VK2BJI OTHR (068) 62 2154.
- YAESU FTDX400 S/N 9052109, spare valves, spkr, $320; Valves 6146, 12BY7, 833A, 832A, QQEO3/12, 2C39, 809, 807, 8116, 6V6, 6AG7, 4-125A, 4CX250B, 5763, 803, 6AQ5, 6AU6 plus lots more; Bob VK2ZHS OTHR (02) 567 5390.
- TOWER 15m galv 3 sect tilt-over HD, remote powered up/down from shack, HYGAIN TH4 triband beam, HAMIII rotator control, BN86 Balun, location Sydney, purchaser to dismantle and remove, urgent sale, $1300; Dennis VK2AEO OTHR (042) 84 4403.
- KENWOOD TS520S xcvr, orig cond, spare xtals, orig packing and invoices, $500; YAESU FT200, exc cond, spare xtals, orig pkg etc, $150; MICRONTA Power SWR tester, unused, $30; OSKER Block SWR 200, $80; or $700 the lot; Barry VK2MFT (066) 42 3936.
- AMSTRAD 6128 CP/m computer, green screen mon with 3" FDD, Word Star W/P, games, data base and graphics programs, manuals, $200 ONO; VK2ENU OTHR (046) 26 4776 7pm-9pm.
- TET Minibeam Yagi 5m span, 2 el, 14/21/28, complete incl docs, some adjustment needed, $100; VK2FFA (043) 24 4160.

FOR SALE VIC

- MASPRO new Yagi 10 el 144 MHz $125; 14 el 430 MHz $100; ARAKI power divider 144 MHz $110; 430 MHz $100; KINGROTOR rotator, 100m cables $300; 10DFB cable and "N" conn 30m, $300; DECIBEL 144 MHz cavity filter $350; YAESU FT 747GX S/N 3L020338 exc cond, MH-1B8 mic, manual $995; YAESU FT209h S/N 4N100794, FTS-6 tone squelch, MH-12A2B sp/mic, FNB-3 Nicad pack, YH2 for hands free, carry case, tech manual, $395; Victor (03) 480 4137.
- DECEASED ESTATE — YAESU FT102 HF all mode xcvr, YAESU YD148 mic, manual; YAESU FT77 HF xcvr, mic, manual; YAESU FP700 PSU, manual; ICOM IC22 VHF FM xcvr, mic, manual; 2 VK POWER MATE 13.8vdc, 5a PSUs; YAESU FT230R 2m FM xcvr, mic, pre-amp, fan, manual; EMTRON antenna tuner EAT300; SWR/POWER meters, model 171, WELZ SP420 144-525 MHz, OSKER BLOCK SWR200; 2m RINGO antenna; WERNER WULF 6 el beam, 10 &15m duobander; IWOSAKI antenna rotator, 26vac control box type 0500, 6 core cable, 40mm OD aluminium tubing 3m long; DSE high power VHF linear amp K6313 13.8v 20a; contact Tom VK3AGH OTHR (03) 379 3315.
- WIND MILL tower, 50ft, to be removed, $100; Ted VK3TG (052) 59 3225.

FOR SALE OLD

- GOLDSTAR CRO model OS7020 20 MHz, new cond, no further use, $500; YAESU FT201 SSB tcvr 80m to 10m, needs new LSB xtal, S/N 4M303198, $150 ONO, (amateurs only); Gordon VK4KAL OTHR (079) 85 4168.
- KENWOOD xcvr TS120S S/N 0020641, KENWOOD AT130 ant tuner (new), KENWOOD HS4 headphones (new), $600 the lot; Jim VK4OK phone Booval (072) 81 8776.
- SWAN 700 CX xcvr 700w PEP, special SS16B sideband model, mint cond, spare pair 8950 finals (new), $750; TENTEC CENTURY 21 QSK CW xcvr, exc cond, $370; both have instruction manuals; Doc VK5HP/4 (076) 61 6200 (bus) (076) 85 2167 (ah).
- BIRD 43 pwr meter, good cond, no inserts, $350; BIRD 43, leather case, inserts 5D and 50B, $650; VK4DY (074) 96 1186.

FOR SALE SA

- RCA comm rx AR88, LF 73 kHz to 30 MHz with books, in fine wkg cond, circa 1940, collectors piece, best offer; VK5QJ, 7 Hewitt Ave, St Georges SA 5064.

FOR SALE TAS

- WELZ CH20A 2 pos quality coax switch (two) for UHF conn, VGC, info leaflet, $35 ea; KENWOOD RD-20 RF dummy load, 50 ohms, 20w for VHF/UHF, GC, $20; Frank VK7LO, OTHR, (004) 33 3231.
- KENWOOD TS520S, exc cond, incl MC50 base mic, new finals, $550 ONO; MFJ ACTIVE ANT $80; ICOM SP7 and SP3 ext spkrs, new; VK7AN (003) 27 1171.

WANTED NSW

- EXT SPEAKER ICOM SP20 or similar, Peter VK2FFA (043) 24 4160.

WANTED VIC

- 12 volt 20-25 Amp PSU, good cond, John (03) 714 8612 after 6.00 pm.
- MOBILE 432 MHz xcv or duo bander in top cond, prefer late model. Pay good price for right rig; Max VK3YBE (059) 85 2671.
- YAESU YM24A speaker/mic in good cond; Jack VK3EB OTHR (03) 882 1769.
- VZ300 computer hardware, colour printer/plotter TOYO type TR 40 or equiv; RTTY module and software; Modem unit; Serial to Parallel interface; Bruce VK3YBW QTHR (03) 527 2661 after 6pm.
- MANUAL and/or CCT for HEATHKIT reg PSU Model IP-20, will re-imburse costs, VK3AEX OTHR (053) 32 3273.
- DOMESTIC or COMMERCIAL SATELLITE rx, must incl cct diag and op handbook, reqd good wkg order, complete ground station preferable, 1 GHz band in/ UHF TV IF out; Vincent VK3AJO QTHR (03) 872 3503.

WANTED QLD

- HELP! any info xcvr 50w AirForce made in USA 30RT 749 ARC-109, 115v 5821-900-4006 Ser No 0000 233 F33657-67-C-0605 522-4304-001, Call Trevor VK4ARB QTHR (07) 269 8848.

WANTED TAS

- COMMUNICATIONS software for Amiga 500, AMTOR, RTTY, PACKET; Mike VK7ME (004) 38 1217.

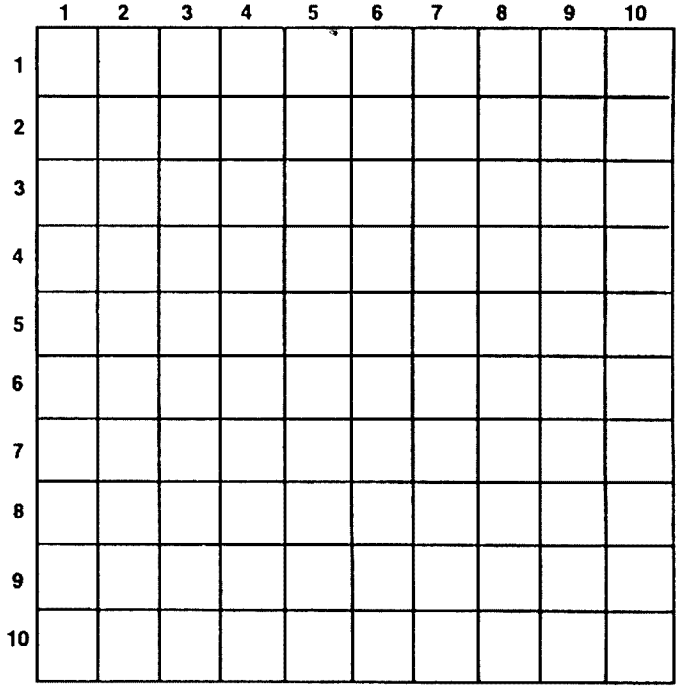
MISCELLANEOUS

- PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.
- 1993 URUNGA RADIO CONVENTION Easter 10-11 April, Australia's finest fox hunting events. Trading, tables, disposals, quizzes, competitions, free tea, coffee, TV. Lounge, hall, amenities under one roof, no steps. Children welcome. Terrific climate 21-24 deg C 44th Anniversary. VK2ADA, VK2DGT, VK2DMS.

ar

Morseword 73

Solution Page 56



Across:
1. Taxi
2 Heat up
3 Twist
4 Competes
5 Facsimile
6 Substance
7 Sth African currency
8 Baulk
9 Curtsy
10 Urn

Down:
1 Mediterranean island
2 London hotel
3 Aged
4 Begin
5 Pond
6 Young Katherine
7 Grandmother
8 At rest
9 Disaster
10 Pen

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: .....Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members" amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

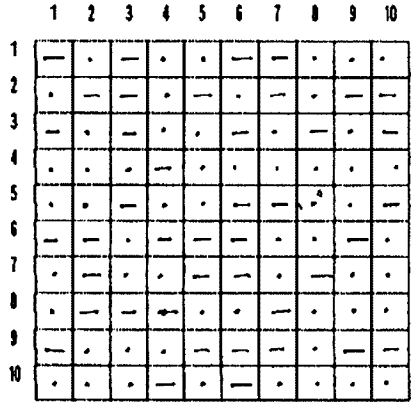
VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

Solution to Morseword No 73

Page 55



Solution to Morseword 73
Across: 1 Cab; 2 Warm; 3 Kink; 4 Vies; 5 Fax; 6 Matter; 7 Rand; 8 Jib; 9 Bow; 10 Vase.
Down: 1 Crete; 2 Ritz; 3 Old; 4 Start; 5 Lake; 6 Katy; 7 Gran; 8 Idle; 9 Ruin; 10 Write.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX163	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1968	BX259	$104.00
Easy Up Antennas	MFJ38	$39.25
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX162	$16.00
Physical Design of Yagi — 35" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 35" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX026	$49.00
Practical Wire Antennas — RSGB	BX296	$28.00
Reflections — Software 5 inch disk	BX358	$20.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$6.60
Smith Charts S/Scale 1 SET co-ord impt/Admir Pack of 10	BX901	$6.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$6.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BATC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$49.95
Radio Call Book North America 1993	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley QTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX266	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX367	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX196	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1978	BX283	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Annrversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BX188	$30.00
MISCELLANEOUS		
Amidon Ferrile Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX306	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$18.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1966	BX262	$79.90
Radio Auroras — RSGB	BX381	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$16.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$36.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing — ARRL	BX386	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX396	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$36.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$16.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX166	$38.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BX167	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX168	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 8th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX446	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX365	$40.00
UHF Compendium Part 1 8 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 8 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX288	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$48.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Car Bumper Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not In stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

ICOM

Count on us!

Icom puts "intelligent" transceiver power in your hands

The future is yours today, in the brilliant new Icom range of handheld transceivers, that put real power in your hands.

Newly-developed AI (artificial intelligence) features in the amazing IC-P2AT and IC-P4AT make for easy operation. The "one-touch" AI button remembers previously used functions for simple repeat action, while a built-in test evaluates your knowledge, customising the unit to your ability. With 100 memory channels, optional 5W power, high speed scan and 24 hour system clock, this many features have never appeared before in such a tiny unit.

For dual band FM Transceiving the IC-W2A gives you simultaneous dual band receiving in the smallest unit in its class. 3-way tuning system, 60 memory channels, 2 call channels are just a start. Optional pager and code squelch functions allow selective calling to individuals or groups. Completely independent speaker jacks, volume and squelch controls are some more of the features in this slim unit that fits comfortably in the palm of your hand.

And for the very best in 2M and 70CM handheld transceivers, offering you full 50-905 Mhz wideband receiving, the IC-2SRA and IC-4SRA give you the works. Widen the borders of general coverage receive with VHF and UHF frequencies plus simultaneous dual band receiving. Rugged, splash resistant handhelds, with dual controls, speaker jacks and antenna, these units go beyond the average amateur's needs, with features like 24 hour clock, On/Off timer, advanced scan functions and total recall capability.

Whatever your transceiving needs, ICOM can give you the future, right now.

For further information call free on (008) 338 915 or write to Reply Paid 1009 Icom Australia Pty Ltd P.O. Box 1162 Windsor Victoria 3181 Telephone (03) 529 7582 A.C.N. 006 092 575

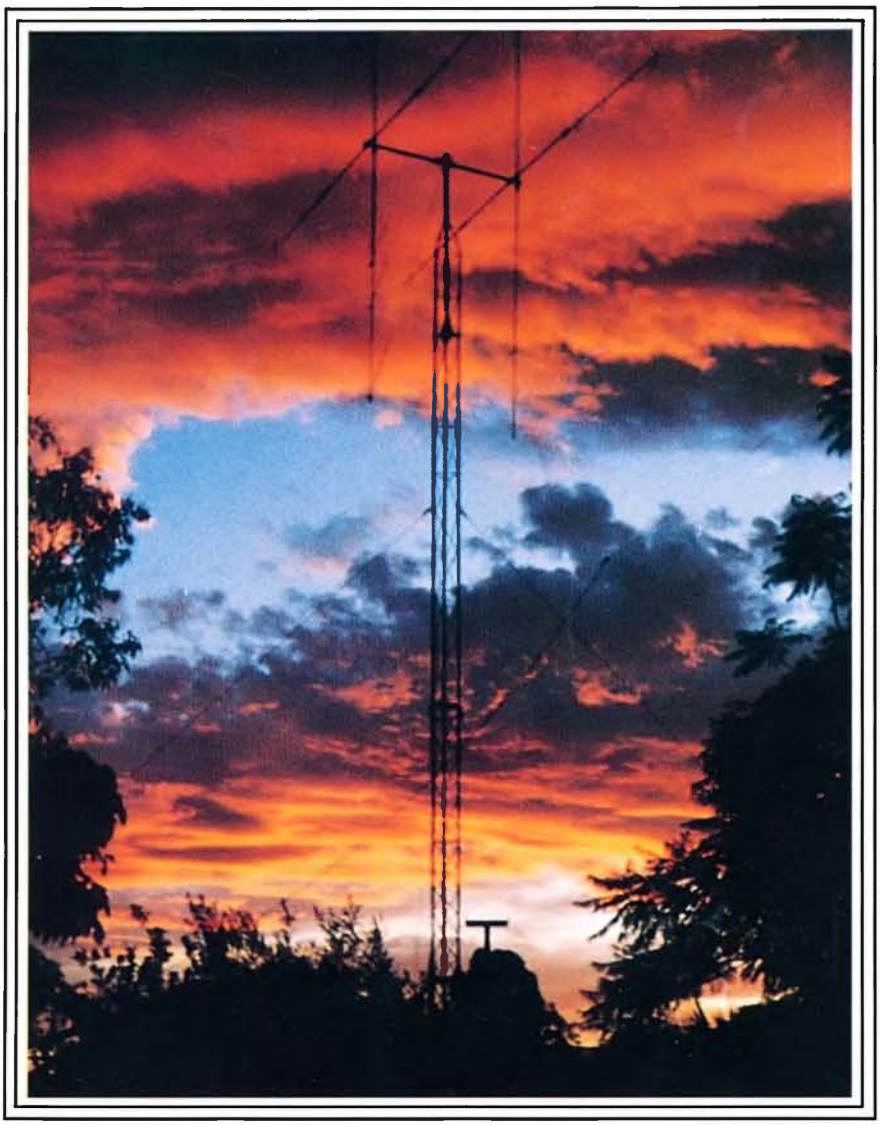
ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.

L.L BROWN ADVERTISING 4034

AMATEUR RADIO

MAY 1993
Volume 61 No 5

Journal of the Wireless Institute of Australia



- Fox Hunt Super Sniffer
- Mount Gambier
- ICOM IC-R72 Review

YOU'D EXPECT A WORLD LEADER IN COMPACT COMMUNICATIONS TO HAVE AN IMPRESSIVE TRACK RECORD

New wave technology in every sense - Kenwood is the definitive way to keep in touch when you're at sea.

Pure as the driven snow - that's the sound quality you'll enjoy when you use Kenwood on cross country skiing trips.

Peak performance - thanks to the rugged reliability of Kenwood.

COMPACT TH-78A DUAL BAND TRANCEIVER

The TH-78A (144MHz/430MHz) sets exciting new standards for portable communication combining simplicity of operation with a multiplicity of sophisticated features. It is an innovative Dual Band Tranceiver ergonomically designed to meet the demands of the Amateur Radio world. Alphanumeric memory, multiple scan modes, DTSS and pager functions, dual-frequency receiver and multi-function memory channels are among the features found in this trendsetter.

Peter Brock

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia. TEL: (02) 746 1519 FAX: (02) 746 1509

N.S.W Argent Communications Blacktown (02) 671 3333, DX Engineering Port Maquarie (065) 849 922, Emona Electronics Sydney (02) 211 0988, F&B Amateur Electronics Ballina (066) 867 204, Lake Maquarie Communications Cardiff (049) 567 255, Macalec Pty Ltd Wollongong (042) 291 455, Reg Stockman Communications Inverell (067) 221 303, Action Communications Kingwood (047) 364 797. **A.C.T** Alex Johnson Aranda (06) 251 4920. **QLD** Emona Electronics Stones Corner (07) 394 2555, Mitchell Radio Co Albion (07) 357 6830. **VIC** Bairnsdale Communications Bairnsdale (051) 524 622, Emona Electronics Melbourne (03) 370 0330, Just Communications Mitcham (03) 873 4142, Measure Tech Supplies Dingly (03) 558 0566, Wecam Wendouree (053) 392 808, Stewart Electronics Components Huntingdale (03) 543 3733, **S.A** International Comms Systems Port Adelaide (08) 473 688. **W.A** Emona Electronics Victoria Park (09) 470 1118, Ford Electronics Osborne Park (09) 242 1766, Leda Electronics St James (09) 361 782, **TAS** Elgin Pty Ltd Launceston (003) 312 711, Elgin Pty Ltd Hobart (002) 344 500.

FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 5 ISSN 0002-6859 May 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
June	10/5/93	12/5/93
July	7/6/93	9/6/93
August	12/7/93	14/7/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

Ron Cocker VK6FD has supplied this impressive view of his 2 element tri-band quad taken one winter afternoon.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service
Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Ron Henderson	VK1RH
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3ZJC
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
WARC & CCIR:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

FEDERAL QSP

All organisations must be able to adjust to the rapidly changing world if they are to survive. The WIA is going through an important period of self-examination and re-organisation. Over the last twelve months the Board has spent a great deal of its time re-examinating the Articles of Association and its method of operation. Some changes are mandatory to comply with new laws introduced by the Government, others simply reflect that we recognize the need to move with the times.

Changes always introduce some uncertainty and turbulence. We need every one involved to show some tolerance and patience. While the year has not been without its problems it has been marked by excellent co-operation by the member states. It is hoped that this environment of understanding will continue.

The Council will of course remain as the supreme policy formulating and controlling body but there is a real need to take a critical view at how we could become a better service organisation for our members at a time when their numbers continue to dwindle.

It is inevitable that the role played by the Board will change — as it has already changed — to comply with the changes introduced by law, and its relationship with the Council is where most of our attention is being focussed as the new draft Articles near completion. Our Annual Convention in May will no doubt spend a considerable amount of its time on these issues. Our Guest speaker will be a corporate lawyer to acquaint the Board members with their duties and responsibilities and to answer questions on the draft Articles before they are sent out to the Divisions for what will no doubt be a very close examination. To facilitate this process the Council has invited the President from each State Division to attend the Convention.

The Federal Office is also changing. The General Manager and Secretary, Bill Roper, has tendered his resignation after completing five years in the job. Since Bill started full time with the WIA his duties and working conditions have changed markedly. In recognition of this a sub-committee of the Board has been revising the duty statements.

Bill has put a lot of hard work into management of the WIA over those five years, not to mention all his EDP efforts. He raised our accumulated reserves from below $1000 to over $100,000. The Federal Council is very appreciative of his efforts and wishes him well in the future.

It is possible the successor position may be split into a part-time Company Secretary, servicing the Council, the Board and ASC matters, together with an Office Manager responsible for day-to-day business. Both positions would be advertised and selection made from written applications received.

We hope that Bill will be able to continue his association with the WIA in a new capacity that will reduce his workload but retain his skills, knowledge and experience.

Rob Apathy, VK1RA, Federal Vice President
ar

It is with deep regret I advise WIA members of the passing of the Federal President, Ron Henderson VK1RH on 26 April 1993 after a short illness.

Condolences have been extended to Ron's family on behalf of the WIA and all members.

Bill Roper VK3ARZ

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Terry Ryeland Bob Lloyd Jones Bob Taylor Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Ken Ayers David Travis	VK4QA VK4KD VK4ATR
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 344 5241	President Secretary Treasurer	Cliff Bastin Phil Street Bruce Hedland-Thomas	VK6LZ VK6KS VK6OO
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			

Note: All times are local. All frequencies MHz.

Weekly News Broadcasts		1993 Fees
3.570 MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70 cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.120, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(148.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00

Membership Grades

Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to ***Australian resident*** (F) (G) (X) grades at fee x 3 times.

VK3MZ Super Sniffer

*Ian Stirling, VK3MZ * describes his "Fox Hunting" Sniffer and discusses hidden transmitter locating.*

This is one facet of amateur radio where home-brewing is still alive and well. Fox-hunting involves the participant in a variety of activities, these range from the construction of simple receivers and antennas to the excitement of the actual hunt.

To be a successful fox-hunter some constructional skills are required to build compact, rugged and reliable direction finding equipment. When tracking the fox transmitter some orienteering skills are required together with some good old fashioned cunning. All these things come together in fox-hunting to produce a friendly but competitive radio sporting activity.

The superhet receiver described in this article is suitable for most pedestrian style fox-hunting events. It combines small size with moderate sensitivity and selectivity. Adjacent band interference can be a problem with simple sniffers. This design however has sufficient selectivity to reject most out of band interfering signals.

The heart of this project is a Motorola MC3362 IC. Although intended for cordless phones, the MC3362 contains some very good building blocks that can be used in other applications. The building blocks are as follows. Two active mixers intended for conversion to 10.7 MHz and then to 455 kHz and a third mixer for the quadrature detector. An outstanding VFO which is capable of operation up to 200 MHz. The internal VFO requires an external tank circuit but has internal varactor diodes which may be used for fine tuning or PLL applications. An internal Colpitts oscillator that only requires the addition of a crystal and two capacitors for operation; also a limiting IF amplifier and squelch circuitry. Only the first two mixers and the two oscillators of the MC3362 are used in this receiver.

A simple diode detector is employed which produces envelope detection of AM and resolution of FM by slope detection. This design also has an audio VCO which is very useful when hunting on signal strength. The human ear is able to detect very small changes in pitch but is fairly insensitive to changes in amplitude. The audio VCO produces a "whoopie" sort of noise which has proven to be very successful in pin-pointing the fox location, particularly where reflections are also being received.

Circuit Operation

The stage associated with the dual gate MOSFET Q1, is an RF amplifier tuned to the incoming fox frequency in the 144 MHz band. As well as providing approximately 20dB of gain and broad selectivity, this stage can be set to give considerable attenuation. Attenuation of the signal is required for close-in DF-ing. The voltage on gate-2 is set by the RF/IF gain control pot. The source of Q1 is biased positive by the 3V3 zener diode. When the voltage on gate-2 is reduced to zero by the gain control, the source is still at about +3.3V. This gives negative gate-2 to source bias, resulting in attenuation in excess of 20dB for the RF stage.

The signal is then coupled to the 1st mixer of IC1, the MC3362. Local oscillator injection into the 1st mixer comes from the internal VCO of IC1. Coarse frequency setting is achieved by adjusting the core of L3. Fine tuning is set by RV1 which changes the bias on varactor diodes within the MC3362 VCO.

The 10.7 MHz component of the 1st mixer output passes through a

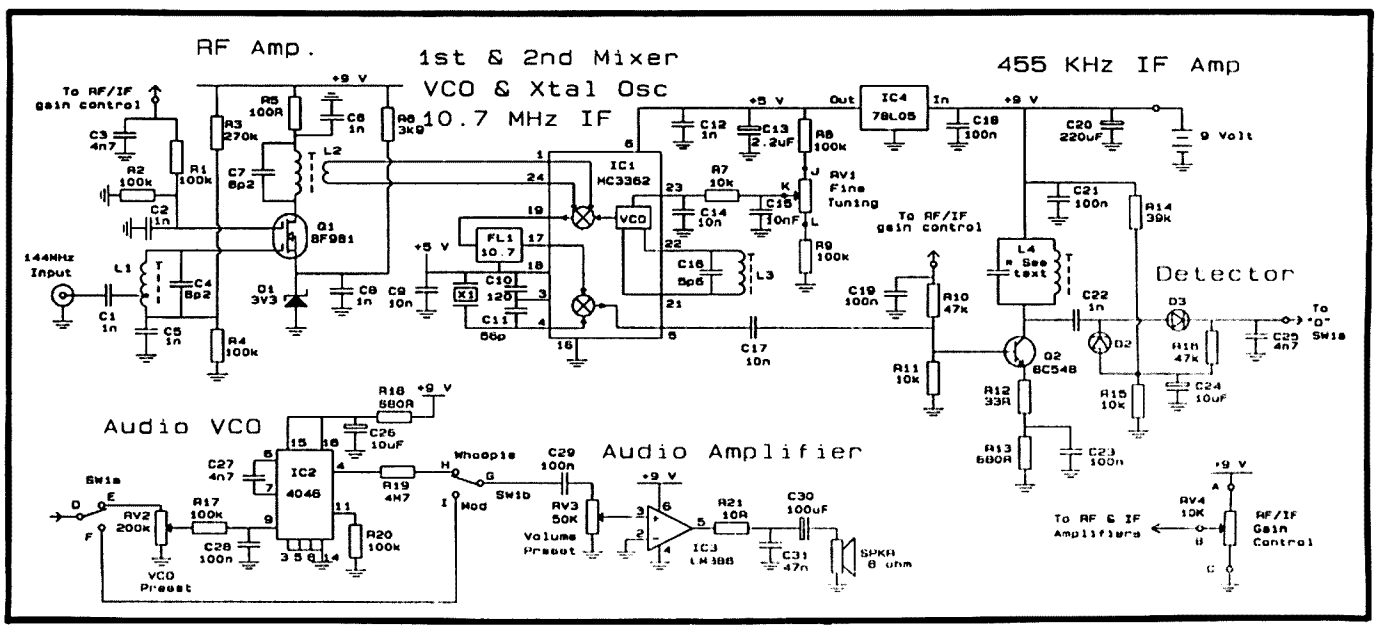


Figure 1 — VK3MZ Super Sniffer Circuit Diagram.

"garden variety" ceramic filter, without amplification to the 2nd mixer.

The 455 kHz output from the 2nd mixer is amplified by Q2 and detected by the simple diode detector D2 and D3. Q2 is controlled by the same gain control that affects Q1. The detector circuit is biased up by R14 and R15 to provide the DC offset that is required to get the VCO of IC2 (4046) into the audible range.

The detector output can be switched directly to the audio amplifier IC3 (LM386) for tone/ modulation reception or it can be switched to the audio amplifier via the VCO of IC2 to achieve a "whoopie" output. The available audio power has been reduced by placing R21 in series with the loud speaker. This is to keep power consumption down and prevent possible damage to a miniature speaker.

IC4 is a voltage regulator and it is used to aid frequency stability by providing regulated voltage to the oscillators of IC1. The VCO is not "rock locked" however the IF window is wide enough to allow for a few kilohertz of VCO drift. The VCO may require fine tuning at the start of an event but does not require any further retuning for the duration of an event.

Any directional antenna may be used with this receiver such as a two or three element Yagi. An optional, but highly recommended addition to this receiver is a passive attenuator. A simple attenuator capable of about 40 dB attenuation helps in preventing receiver overload when DF-ing close in to the fox transmitter.

The project described in this article is for the 144 MHz band but with changes to the tuned circuits of L1, L2 and L3 this receiver could be tuned to any band below this frequency. The bypassing and supply decoupling capacitors of the Q1 stage would also have to be changed accordingly.

Construction Notes

This project is fairly straightforward but some RF construction experience would be required to build a unit that performs to the specifications.

Insert and solder the flat components such as resistors and ICs first, followed by the capacitors and coils. The PCB has a copper ground plane on the top side. When inserting the ICs make sure the shoulders of the IC pins do not make contact with the ground plane. Many components have one lead soldered directly to the ground plane, this is indicated on the assembly diagram by a 'blob' on one end.

Insert a piece of tinned wire in the hole adjacent to pin 16 of the MC3362. Solder this wire to the ground plane and the underneath track. This joint connects the ground plane to the ground of the MC3362. Insert and solder a PCB pin in the pad near L1. The RF input is also soldered to this pin. The BF981 is inserted with the writing facing upwards and it should be inserted last. C1 is soldered between the PCB pin near L1 and one turn from the "cold" end of L1.

Alignment Procedure

Set RV1, RV2 and RV3 to the mid position. Apply power. A hissing noise should be heard from the speaker

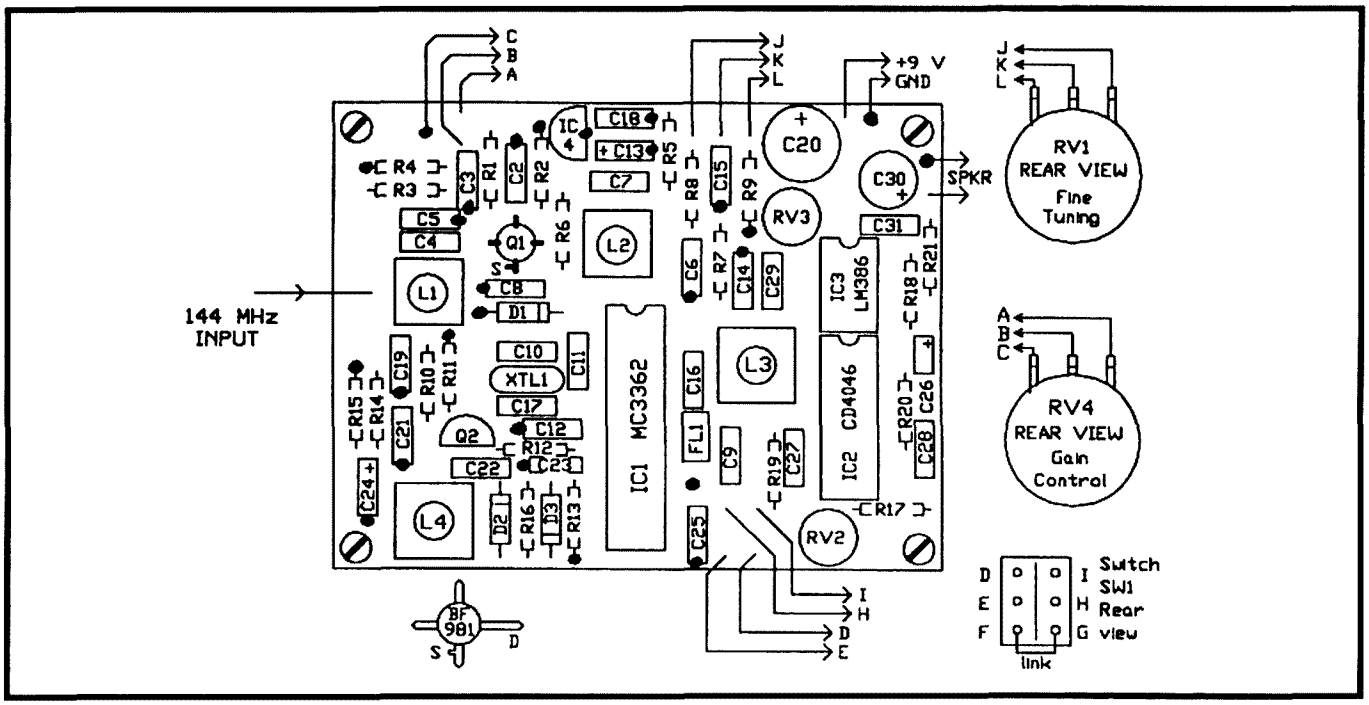


Figure 2 — Component Layout for the VK3MZ Super Sniffer.

when the "mod" position is selected and the RF/IF gain control (RV4) is set to the maximum position. If this is not the case check all joints and the wiring to the switch and pots, also check DC voltages.

Apply a strong, tone modulated signal into the RF input. Set the gain control to maximum and the fine tuning control (RV1) to the mid position. Adjust L3 until the modulation tone is heard. Adjust L1 and L2 for maximum received signal, the input level should be progressively reduced as the alignment proceeds. Check that RV1 allows fine tuning.

Reduce the RF input to zero and switch to the "whoopie" position. Adjust RV2 to produce an audio tone output of about 200 Hz. Increase the RF input amplitude and the audio tone will increase in pitch. This is the "whoopie" action of the audio VCO. The highest whoopie pitch can be altered by selecting R20 to suit. Increasing R20 reduces the highest pitch. Adjust the volume pre-set to a comfortable listening level and happy hunting.

Super Sniffer Specifications

Dual conversion with IF frequencies of 10.7 MHz and 455 kHz. Bandwidth — 20 kHz approx. (depends on L4) Minimum Discernible Signal — less than 0.5 μV.

Tuning range — Coarse, the full 2-metre band and beyond. Fine tuning, +/– 50 kHz.

Power requirements — single 9 volt, 20mA approx.

PCB Dimensions — 65mm x 80 mm (top-side ground plane)

Component Sourcing

Most of the components are standard and should be available from the regular component shops.

The frequency of the crystal is not critical. The difference between this crystal and 10.7 MHz sets the 2nd IF frequency. The prototype is laid out to accept a 455 kHz broadcast transformer. These can be tuned tens

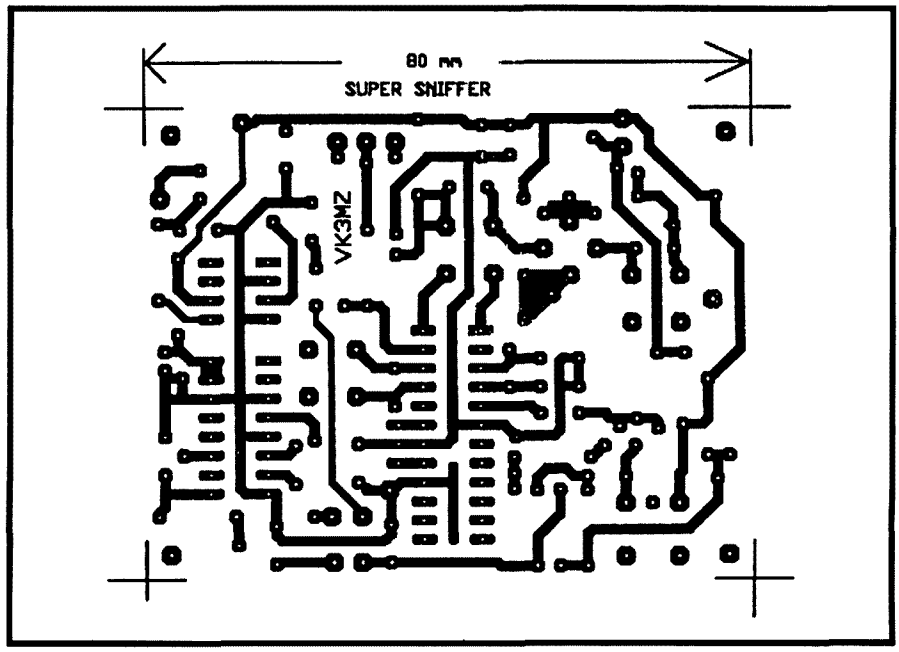


Figure 3 — VK3MZ Super Sniffer PC Board (Actual Size).

of kHz either side of 455 kHz which allows for crystals other than 10.245 MHz precisely. In fact if you want to make your own IF transformer the choice of crystal and 2nd IF frequency is up to you.

FL1 is the 10.7 MHz ceramic filter. Most 3-pin 10.7 MHz ceramic filters will be suitable.

PCBs are available from the author at $9.00 each plus self addressed envelope. I also have a limited number of coil formers, screening cans, ICs and crystals. If you have trouble sourcing these components write to me for further details.

Resistors

0.25 watt
R1 100k, R2 100k, R3 270k, R4 100k, R5 100R, R6 3k9, R7 10k, R8 100k, R9 100k, R10 47k, R11 10k, R12 33Ω, R13 680Ω, R14 39k, R15 10k, R16 47k, R17 100k, R18 680Ω, R19 4M7, R20 100k, R21 10Ω.

Capacitors

Ceramic or mono — block unless otherwise stated.

C1 1n, C2 1n, C3 4n7, C4 8p2, C5 1n, C6 1n, C7 8p2, C8 1n, C9 10n, C10 120p, C11 56p, C12 1n, C13 2.2u tant, C14 10n, C15 10n, C16 5p6, C17 10n, C18 100n, C19 100n, C20 220μF electro, C21 100n, C22 1n, C23 100n, C24 10μF electro, C25 4n7, C26 10μF electro, C27 10n, C28 100n, C29 100n, C30 100μF electro, C31 47n.

Semiconductors

IC1 MC3362, IC2 CD4046, IC3 LM386N-1, IC4 78L05
Q1 BF981, Q2 BC548
D1 3V3 zener, D2 OA95 etc.

Potentiometers

RV1 10k linear
RV2 100k trimpot- cermet miniature.
RV3 50k trimpot- as per RV2.
RV4 10k linear.

Coils

L1, L2 and L3 wound on Neosid 4-pin, 5mm former 52-061-64, F29 screw cores. L2 and L3 have screening cans.

Wind carefully to ensure that the shielding can does not touch the wire where it terminates on the former pins. L1, 4 3/4 turns on a 5mm former, 22 SWG diameter tinned copper wire, spacing between turns of one wire diameter, tap at 3/4 turn from C5 end. L2, 4 3/4 turns on a 5mm former, 24 SWG enamelled wire. 1.25 link turns wound around bottom of L2.

L3 same as L1 but no tapping.

T1, 455 kHz IF transformer from old pocket radio etc with integral capacitor.

Miscellaneous

Ceramic filter 10.7 MHz Murata SFE10.7MA etc.
Crystal 10.245 MHz, 10.24 MHz etc.
Miniature 8-ohm speaker.
Metal box.
Hook-up wire and mounting hardware.
Switches, 9V battery clip.

* *169 Glenvale Road, Ringwood North Vic 3134*

ar

WIA News

Amateur Radio In Yellow Pages

Amateur radio clubs and associations can now be listed in the 1993 Yellow Pages directories, in all appropriate Metropolitan and Country issues around Australia.

The Yellow Pages National Headings Committee has agreed to a new index cross reference of "Clubs — Radio — See Clubs — Social & General".

Last year, following a Federal Board resolution at the October quarterly meeting, the Federal Secretary/General Manager was given the task of seeking from the Yellow Pages National Headings Committee that a national heading of "Clubs, amateur radio" be created, so that the WIA and amateur radio clubs and societies who wanted to be listed could be readily contacted by people seeking information on amateur radio and amateur radio organisations.

The National Headings Committee replied on 3 March with the above advice on the new cross reference index, saying they believed "this is a more appropriate means of addressing the referencing needs of directory users and supporting the advertising needs of our clients on a national basis."

Not the result we all wanted, but an advance on the current situation. Write to your local Yellow Pages people with contact details of your Division, club or society now.

Beveridge Honoured

Harold H Beveridge, ex-W2BML, died in January in New York state. He was 99 years old.

His name, if you hadn't already realised, is immortalised as the inventor of the Beveridge receiving antenna. He originally dubbed it the "wave antenna". Developed in 1917 to enhance communications between the US and Europe during WWI, it was first described in QST in November, 1922.

With more than 40 patents to his name, Beveridge considered his two greatest inventions were the wave antenna and diversity reception (which combats the effects of fading).

Beveridge received the American Institute of Engineers" Gold Medal in 1957 for his work in "national and world-wide radio communications."

A Postcard from Mount Gambier

*Ivan Huser VK5QV. * tells us what Mount Gambier is REALLY about.*

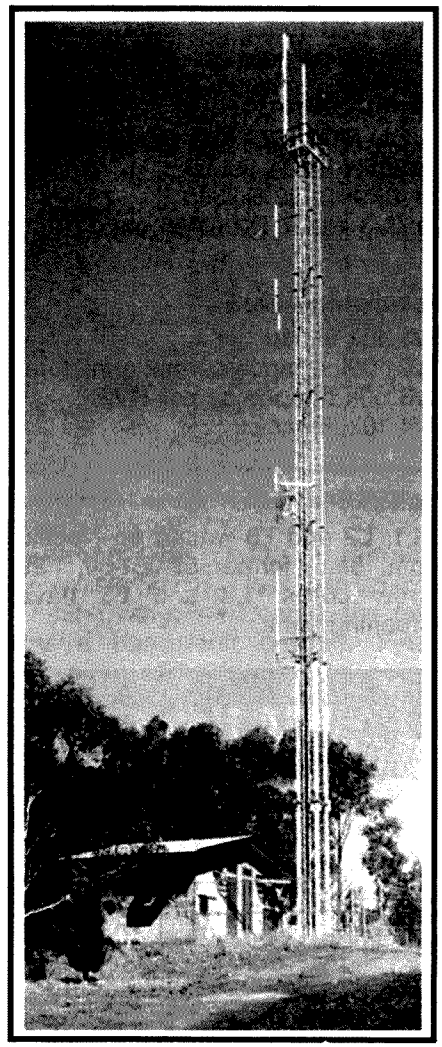
For readers not wholly familiar with Mount Gambier, let me say that it is tucked away down in the lower south-east corner of South Australia, about halfway between Adelaide and Melbourne, close to the Victorian border, and about 27 kilometres from the southern coastline (Lat 37.50 S Long 140.46 E). Among the many attractions of Mount Gambier is the famous Blue Lake and the equally famous South East Radio Group (SERG) Convention held each year over the Queen's Birthday holiday weekend in June.

Volcanic Activity

The Crater Lakes of Mount Gambier are the result of volcanic activity. The outbursts (which would have been spectacular) took place along the edge of the main zone of activity centred in southern Victoria. Carbon dating of plant remains has shown that the main period of activity occurred around 4000 years ago well within the time of occupation by the original aboriginal inhabitants, and very recent in geological terms.

The eruptions were generally along lines of crustal fissuring starting with small flows of basaltic lava. Water from the shallow regional water table percolated down the volcanic conduits leading to the rapid accumulation of superheated steam. This caused the explosions that produced the craters and blowholes from which thick deposits of ash and scoria were ejected. The well known Devil's Punchbowl within the lakes complex is an example of such a steam vent.

The explosions caused large blocks of basalt and limestone (some weighing more than 20 tonnes) to be thrown out. Several examples of these volcanic "bombs" can be seen around the area lying in ash deposits. Although no eruption has occurred within recorded memory, it is impossible to predict whether the volcanoes will erupt in the future.



The communications tower at Potter's Point.

The Blue Lake

The best known of the Crater Lakes is the Blue Lake, which is 77 metres deep, five kilometres in circumference, and contains approximately 36,000 megalitres of water. Known as "Waawor" to the original inhabitants, the Blue Lake has been Mount Gambier's water supply since the late 1800s.

The water supplying the lake comes from the rainfall to the north via a confined limestone aquifer, and it has been estimated it could be several thousand years before this water actually reaches the lake.

Carbon dioxide brought down with rain enables calcium (limestone) to be dissolved in the water as calcium carbonate. During the warmer months (mid-November to mid-March) crystals of calcium carbonate grow in the relatively warm water near the surface of the lake. The length of the crystals is resonant at the frequency of blue light, and so the lake takes on its distinct cobalt blue colour during this period.

The Blue Lake is best viewed near the middle of the day, between Christmas and New Year, when the sunlight strikes the surface of the lake at approximately right angles. Some of the light falling on the lake is reflected from the boundary between the warmer water near the surface and the colder water below. It is this boundary reflection of the light that produces the characteristic iridescence of colour.

The Dreamtime Legend

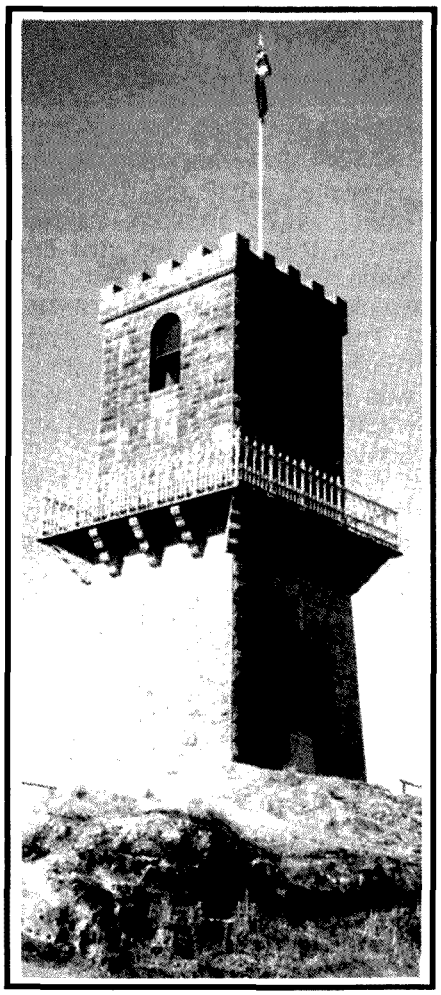
The Dreamtime legend of the local Booandik tribe of aborigines tells of the giant "Craitbul" and his family who wandered around the region looking for a place to live in peace. They camped and made ovens at Mount Muirhead to the north-west and at Mount Schanck to the south, but were frightened off both sites by the moaning voice of a bird spirit.

Moving to the Mount Gambier region, they managed to escape from the spirit and live there for a very long time. Again they made an oven, but one day water came up from below and put out their fire. They made others, each in turn being filled with water, until a total of four ovens had to be deserted.

Disgusted by their misfortunes, Craitbul and his family departed in search of a place where they might dig another oven, but no-one knows where they went. It is these deserted water-filled ovens that form the beautiful Crater Lakes of Mount Gambier.

Centenary Tower

Centenary Tower stands majestically on top of Mount Gambier, about 190 metres above sea level. It was built as an observation tower to



Mount Gambier's Centenary Tower, 190 metres above sea level.

commemorate the centenary of the sighting and naming of Mount Gambier on 3 December 1800 by Lieut James Grant RN, from HMS "Lady Nelson", while exploring the southern coastline of Australia.

The tower cost 482 pounds, 11 shillings and sixpence, and was funded by local subscription. The foundation stone was laid on 3 December 1900 by Sir Samuel James Way, the then Chief Justice of South Australia. However, due to lack of support, the tower was not completed until 1904, and was officially opened on 27 April of that year, before a gathering of 450 adults and 300 school-children.

From the tower, an area of approximately 8000 square kilometres can be scanned with spectacular views of the Crater Lakes and the City of Mount Gambier. The Grampians can be seen to the north-east with Mount Schanck (another extinct volcano) and the Southern Ocean to the south. The horizon from this vantage point is 50 kilometres away.

When the flag is flying, the tower is open to visitors, and yours truly (Ivan VK5QV) is "in residence" as caretaker; so, come and make yourself known the next time you are in Mount Gambier.

For many years, the tower housed two-way radio communication equipment for public utilities and private companies, with antennas attached to each corner. At one time a HF wire antenna could be seen strung between the tower and a convenient radiata pine (what else) tree.

Although most of the radio equipment has been removed in recent years, two units still remain. This remaining equipment is installed on the roof of the tower, with a four-element Yagi (around 450 MHz) pointing towards Victoria, and a second antenna (around 77 MHz) cunningly disguised as a flagpole. Or is the flagpole disguised as an antenna?

During the fire season, the tower is used for fire spotting. When on duty, the fire spotter uses the roof where a sighting compass is placed and the top floor of the tower where the maps and communication equipment are housed. Communication is mainly by telephone, with a hand-held transceiver providing the necessary back-up.

South-East Radio Group

The genesis of the South East Radio Group can be traced back to the late 1950s and early 1960s when, over a period of time, a small group of enthusiastic short-wave listeners visited the shack of Stuart VK5MS and listened to a number of talks given by Col VK5CJ.

It was, however, the transfer of Al Rechner VK5ZCR (now VK5EK) from Adelaide to Mount Gambier that triggered the callsign explosion in the early 1960s, leading directly to the formation of the South East VHF Radio Group in 1962. With the members all having "Z" calls, there was a common interest in that part of the radio spectrum 50 MHz and above; hence the initial VHF bias.

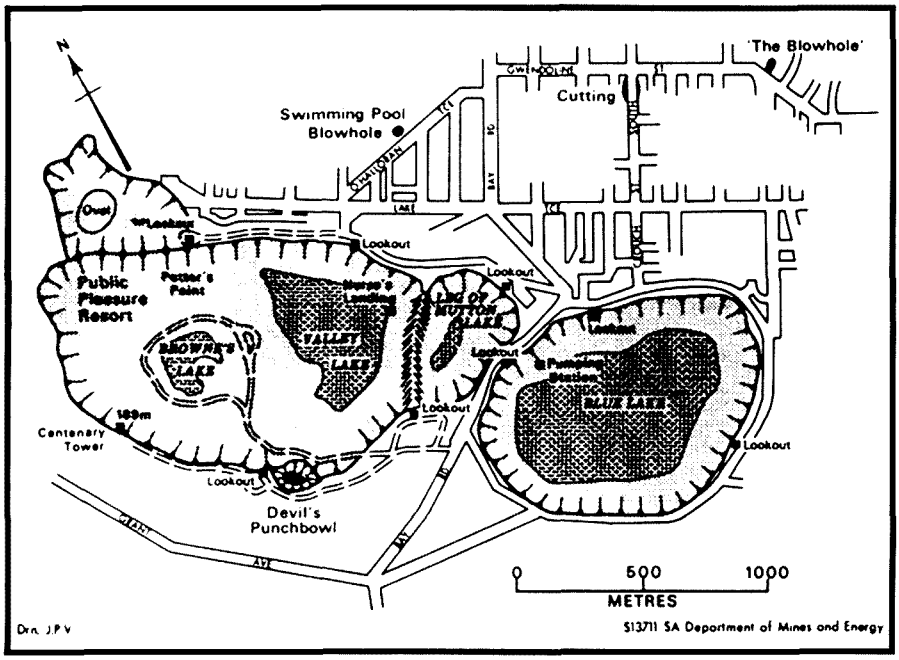
A "Who's Who" of foundation members includes:

John Lehmann	VK5ZHR	now	VK4AZK
Les Janes	VK5ZLS	now	VK1BUC
Dale Aslin	VK5ZER	now	VK5DA
Gary Smythe	VK5ZGR	now	VK5JR
Colin Schultz	VK5ZEV	now	P29?? (last known)
Colin Hutchesson	VK5ZKR	now	VK5DK
Trevor Niven	VK5ZTN	now	VK5NC
Jim Sinclair	VK5ZSJ	now	VK5ZSI (last known)
Chris Skeer	VK5ZFA	now	VK5MC
Trevor Hutchesson	VK5ZTH	now	VK5TH

For the first two years, meetings were held at the homes of members before the group moved to its first clubrooms, a two-roomed building at the rear of a deserted house situated close to the edge of a quarry at Glenburnie, some distance to the east of Mount Gambier.

This old, but comfortable, building was used as clubrooms for about 10 years, but as the quarry expanded the group was forced to move.

After several temporary meeting places, the group approached the corporation of the City of Mount



Map of Mount Gambier's crator lakes (with grateful acknowledgement to the South Australian Department of Mines and Energy).

Gambier for assistance in finding a permanent home. The result of this application is the present clubrooms in Olympic Park, just off O'Halloran Terrace on the southern side of the city.

Mount Gambier has an official population of around 23,000, and an amateur population of some 50 callsigns. Many amateurs in the area are "old timers" and can go back quite a way (some even remember valves). It is interesting to note that of the 38 VK5 members listed in the Radio Amateur Old Timers" Club Journal (current at the time of writing), 11 are from Mount Gambier and the surrounding district. This figure equates to approximately 30 per cent and must surely be some kind of record.

SERG Convention

The first convention was held over the June long weekend in 1963 and, since then, has become a very popular annual event. In 1993 the South East Radio Group held its 29th convention, and it was the fourth year that the National Fox Hunt Championship has been held as an integral part of the convention.

Over the years, the South East Radio Group has attempted to foster an interest in the noble and ancient art of "home brewing" by conducting its very popular home-brew competition at the convention. With some positive and most welcome support from a person who wishes to remain anonymous, the competition has been enhanced in recent years with the introduction of various categories from the novice to the very experienced. There are categories to suit everyone and, rest assured, all entries will be well looked after.

The South East Radio Group Convention will once again be held over the Queen's Birthday long weekend (12 and 13 June 1993) and promises to be bigger and better than ever, with trade displays, disposal tables, competitions etc, and not forgetting the renowned SERG dinner superbly presented by the ladies of the group.

Further information regarding the convention and accommodation may be obtained by writing to the Convention Co-ordinator, South East Radio Group, Box 1103, Mount Gambier, SA 5290.

May I conclude by saying "Welcome to Mount Gambier and the 29th South East Radio Group Convention, and don't forget to bring along that piece of home-brewed equipment".

* *7 Bond Street, Mount Gambier, SA 5290*

ar

WIA News

IARU Launches Newsletter

The IARU has launched a newsletter, entitled *IARU News*. Compiled by Richard Baldwin W1RU, IARU President, the first issue was datelined February 1993.

The lead article in the two-page issue, on "The ITU Restructures", was authored by Michael Owen VK3KI (IARU Vice President) and David Sumner K1ZZ.

Of particular interest was an item on **Sweden's introduction of an entry-level, code-free licence.** Dubbed a "Class N" (Novice) licence, it is intended to encourage young students to become radio amateurs.

The new Class N licence can be held from the calendar year the licensee turns 10 years old, but until age 14 the young person is under the supervision of an older amateur holding one of the standard licenses.

The Novices are permitted to operate on the 2 m and 70 cm bands, with power limited to 25 W PEP output and 100 W erp. The examination covers regulations, accepted safety standards and common amateur radio procedures. Novices are required to upgrade to a standard license within six years.

New Society for Canadian Amateurs

Canadian amateurs have had the choice of belonging to two amateur radio organisations for some years — the Canadian Radio Relay League and the Canadian Amateur Radio Federation. The two societies will merge this month to form the Radio Amateurs of Canada. The inaugural meeting is scheduled for 3 May.

The two societies will hold their final individual meetings on 1 May; their respective publications, *QST Canada* and *The Canadian Amateur*, will both publish in May and June. Their new joint magazine, *The Canadian Amateur*, will appear for the first time in July.

EQUIPMENT REVIEW
The ICOM IC-R72 All Mode HF Communications Receiver

*Ron Fisher VK3OM * looks at ICOMs latest receiver technology.*

ICOM have built up an enviable reputation with their line of HF communication receivers over the last ten years or so, The R-70 and R-71 receivers both performed to near professional standards but at non-professional prices. Many of these receivers have found their way into government and commercial organisations where they operate 24 hours a day with excellent reliability.

The IC-R72 has been around for a couple of years now and I thought it high time we had a close look at it. Compared to the R-70 and R-71 receivers, the operation of the R-72 has been greatly simplified. However in achieving this, many features of the earlier receivers have been eliminated. To balance this to some extent, some new features have been added.

It is both smaller in size and lighter in weight than its predecessors and is in fact compatible in size and appearance with the IC-725 and IC-728 amateur HF transceivers. Frequency coverage is guaranteed from 100 kHz to 30 MHz, and receive modes are upper and lower sideband, CW, AM and FM. The latter is available only as an option. An AC power supply is built-in and operation from 12 volts DC is possible, but this requires an optional power cord and socket.

Dimensions are a compact 241 mm wide, 94 mm high and 229 mm deep and the all up weight is 4.8 kg. Having been brought up in the days when some form of a communications receiver was an essential part of the shack, I still consider a good receiver as a standard item in my set up. With most modern transceivers incorporating a general coverage receiver, I can appreciate many *amateurs* thinking that they can get along without a separate receiver. Well maybe, but one thing a modern transceiver cannot do is transmit and receive at the same time. You might need to check your transmitter for spurious outputs, check a contact on 80 while you are working on 20. The possibilities are only limited by your needs and imagination. If you have yet to qualify for your HF licence, then a good receiver is the way to check out activity on the DX bands, or maybe to listen to your local WIA broadcast. Interested? Well let's have a good look at the R-72 and see if it fits your requirements.

The attractive front panel of the ICOM IC-R72 receiver.

The IC-R72, Features and Facilities

Now let's look a bit closer at the R-72. It is double conversion for all modes except FM where it is triple conversion. The first IF is 70.45 MHz, the second is 9.01 MHz and the third (for FM only) is 455 kHz. The main SSB and AM filters are at 9.01 MHz and two narrow CW filters are available as options. Like any good piece of modern equipment, the R-72 is microprocessor controlled.

Frequency selection is via the smooth tuning control in ten Hz, one kHz, and one MHz steps. Direct frequency entry is available via the front panel key pad which lets you enter down to the last 10 Hz for spot-on accuracy. The actual tuning knob is extremely smooth to use and is heavily weighted to allow spinning across wide sections of the band.

When the AM mode is selected, the tuning rate changes to 1 kHz steps although this can be changed to 10 Hz steps if required. In the SSB and CW modes 10 Hz steps are the automatic selection. Frequency and status readout is via a large and clear LCD display. Frequency readout is to 10 Hz and mode and memory channel number are clearly displayed. To the left of the display is a fairly small "S" meter which is calibrated in standard "S" units up to S9 plus 60 dB and up to 5 for SINPO reports.

A common question asked about a piece of equipment these days is, how many memories does it have? Well the R-72 should satisfy everyone. It has 99 memories which store both frequency and mode. As we will see later, some of these memories can be used in rather ingenious ways. As an aid to sight impaired listeners, ICOM offer a speech frequency readout.

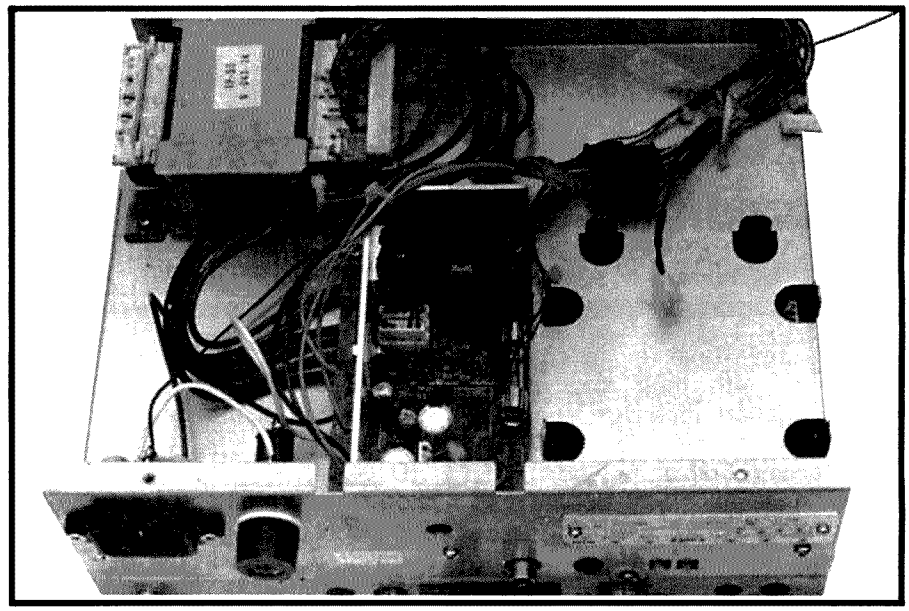
In line with its simplified operation, there are only three rotary controls, AF gain, squelch, and of course the tuning knob. There is no RF gain, bandpass tuning or notch filter. The AGC is switchable for fast or slow decay, but as there is no RF gain, it cannot be switched off. Ten and twenty dB front end attenuators are provided and can be cascaded to give 30 dB. The receiver RF stage can be switched in or out to improve strong signal handling. To complete

the interference rejection facilities, a two position noise blanker selects normal or high blanking level.

Another operating aid is a built-in clock which can be set to turn both the receiver and an external tape recorder on and off. There is also another remote connector which will switch a tape recorder on and off when the squelch opens and closes. Very handy if you need to record a signal expected to come on air at some unknown time.

A unique feature is the AM tuning indicator. This lights up when an AM signal is correctly tuned. I found that it lights when the signal is within +/– 500 Hz of the tune position.

The rear panel provides a variety of interfacing connectors. AC power input is via an IEC three-pin socket which these days seems to be the standard. Both high and low impedance antenna inputs are provided, via an SO-239 coax for 50 ohms, and a pair of terminals for 500 ohms. One terminal is for the antenna and one for the earth connection.



Under the top cover. This is the power supply. The open space on the right is for an internal battery tor self contained operation.

The IC-R72 On The Air

I connected the receiver up to my multi-band dipole and Z match ATU. This enabled me to tune the system up on most frequencies covered.

Jumping from one frequency to another proved very easy. A push of the MHz button allows you to step up or down in one MHz steps using the main tuning control. Tuning up or down in one kHz steps is achieved in the same way. At long last, ICOM have put right the jumping frequency effect when changing sidebands in SSB mode. With the R-70 and R-71, change of sidebands produced a 3 kHz change in frequency readout. Tuning with AM selected changes the tuning rate up to 1 kHz steps which is one hundred times faster than SSB tuning. I would much prefer 100 Hz stepping as I feel the 1 kHz rate is too fast. It is possible to select the 10 Hz rate for AM, but this is then too slow. Please look at this one ICOM.

Audio quality via the external speaker is quite reasonable, but as the speaker is mounted in the top of the cabinet and therefore firing directly upwards, I am sure that in many situations an external speaker would have an advantage. I tried the receiver with the SP-3 external speaker with very good results.

Another thing noted early on was that the "S" meter was very reluctant to move off the stop on many very readable signals. Putting the "preamp" on helped, but did not overcome the problem. Later tests were to show why (see test section of this review).

The memory and scanning facilities on the receiver are most impressive. Let's look at the scanning first. There are four modes of scanning; programmed scan, memory scan, selected memory scan and the auto-write memory scan. The programmed scan searches between any two operator selected frequencies, these being entered in memories P1 and P2.

The scan will stop when a signal is received and in the case of an AM transmission it will stop right on frequency, because of the AM tune facility. Depending on the position of a rear panel switch, the scan will either stop until the signal goes off, or it will resume scanning after ten seconds.

The auto-memory scan is the ingenious one, though. Scanning the same range as set between P1 and P2 the receiver will put into memory the first 20 AM signals received. Great if you want to check out the activity on one of the shortwave broadcast bands.

One thing missed is any form of audio top-cut control. Band pass tuning would be ideal of course. Even a common tone control could be a big help in removing high frequency audio interference, particularly when trying to dig out weak AM signals.

In general, the receiver sounded very lively particularly with the preamp switched in. No trace of front-end overload was noted. ICOM do offer (as an option) a receiver protector unit. It actually opens the antenna circuit if you happen to fire up a kilowatt transmitter next door!.

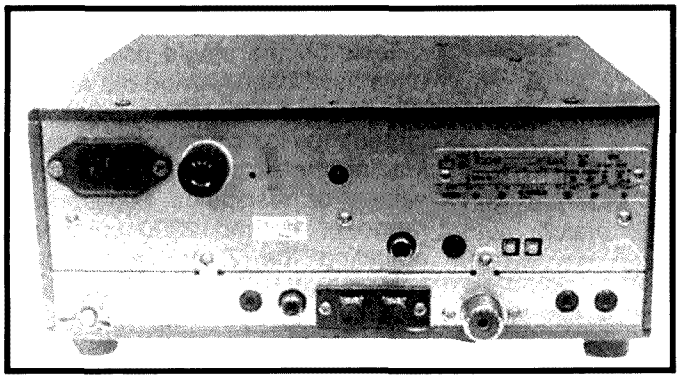
The best feature of all is the wonderful ICOM memory system. Select a memory and then tune away from it, up and down the band. Push the memory button again and you are returned straight back to the memory channel. Surely the most versatile memory system of all.

The R-72 On Test

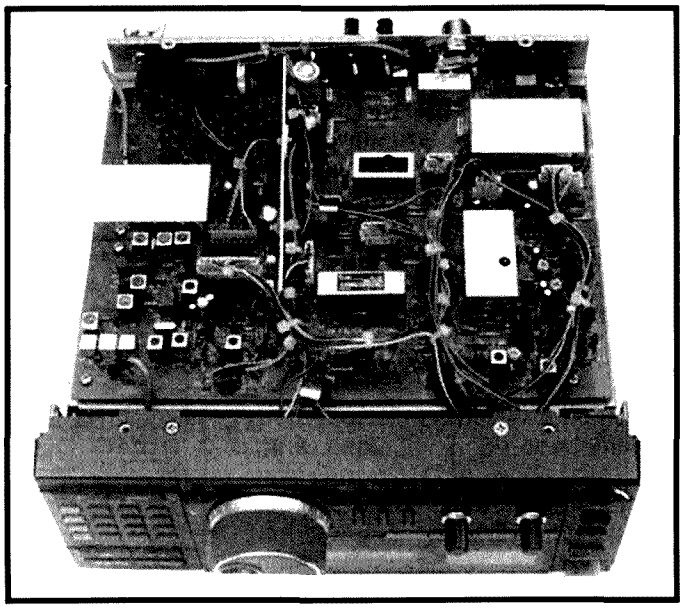
Confirming our on air tests, the receiver turned in a very good result in our lab tests.

The sensitivity was very level right across the whole HF range and averaged 0.25 μv for 10 dB SINAD for SSB and CW.

The "S" meter measurements showed up our concerns mentioned earlier. At S9 an input of 40 μv was required with the preamp switched in, and 80 μv with it out. So far so good.



Rear panel of the ICOM IC-R72.



The main circuit board of the ICOM IC-R72 receiver. The SSB filter is in the centre of the photograph.

At the low end of the scale though, 5 μv was needed to give an S2 reading with the preamp in, and 10 μv with the preamp out. With conditions the way they are on the higher frequency bands, you won't see the "S" meter moving a lot!

Audio response in the USB mode measured at 14.2 MHz was -6 dB at 170 Hz and 2.5 kHz. The curve between these points was very smooth.

Response in the AM mode at the 6 dB points was measured at 100 Hz and 2.7 kHz. It seems that the audio end of the receiver was a slightly restricted response for a communications receiver is fair enough. Receiver audio output was measured at the external speaker jack. Terminated with a 4 ohm load, 4.8 watts at 10% distortion was produced. With an 8 ohm termination this dropped to 2.2 watts which is just a fraction above ICOM specification. SSB audio distortion at 500 mW output was a creditable 0.75%.

A final test noted that there was a significant difference in the response of lower sideband compared to upper sideband. As no circuit is supplied, it was not possible to determine the system used to produce the carrier frequency. However it may well be similar to the circuit used in the IC-725 transceiver, which suffers a similar quandary. Calibration accuracy was excellent, within +/– 20 Hz. If you require something better than this, a high stability temperature controlled master oscillator can be installed as an extra cost option.

The IC-R72 Conclusions

The R-72 is a very competent full coverage receiver.

It offers very simplified operation and therefore can be recommended to most short wave listeners. If you like to pull through the hard-to-find signal on the short wave broadcast bands, you might find the performance lacking in several areas. Without bandpass tuning, a notch filter or even a tone control you don't have a lot of control over what you are receiving. In other words, it doesn't take the place of the R-71 which does incorporate most of the above. To be fair though, I am sure the R-72 wasn't designed to replace the R-71. The AM received quality is much better than the R-71 and the frequency readout definitely superior.

The instruction manual is aimed at the general operator and covers these aspects well. Service manuals are available for the technically minded.

Our thanks to ICOM Australia for the loan of our review receiver and all enquiries should be directed to them. Current retail price of the IC-R72 is $1664-60.

* *"Gaarlanungah", 24 Sugarloaf Road, Beaconsfield Upper Vic 3808*

ar

WIA News

Call for Papers

The ARRL Conference on Digital Communications (formerly the Computer Networking Conference) has issued a call for papers.

Technical papers for the Conference may be on any aspect of digital communications in Amateur Radio.

Deadline for receipt of camera-ready papers is 30 July, 1993. The Conference has been tentatively scheduled for 11 September at the University of South Florida in Tampa, Fl USA. It will be hosted by the Tampa Local Area Network.

Further information can be obtained from Maty Weinberg at ARRL HQ, 225 Main St, Newington, Connecticut 06111 USA. (Thanks to the ARRL Newsletter).

Growth In Japanese Amateurs

The number of amateur radio operators in Japan had reached almost one and a quarter million by September last year. With 1,242,550 stations licensed, amateurs represented 15.5 per cent of all radio and communications stations licensed in Japan at the time.

In the three months between June and September, the number of amateur licensees grew by 20,336 — that's more than the total amateur population of Australia!

AR Single Coil Z Match — Part 2

In the final part of this interesting article, Lloyd Butler VK5BR describes his in-depth experiments, and the overall performance of the AR "Z" match, plus modifications to use the AR Z Match on 1.8 MHz.*

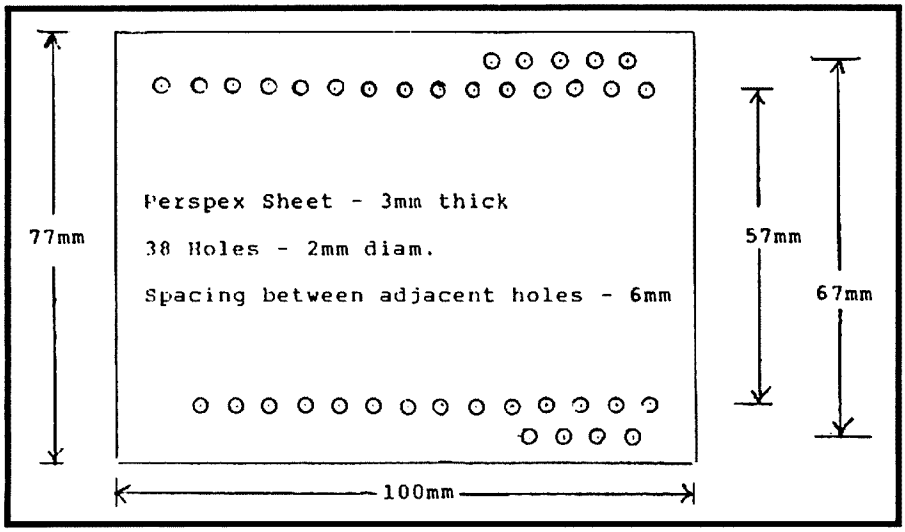


Figure 3 Perspex support sheet for coil

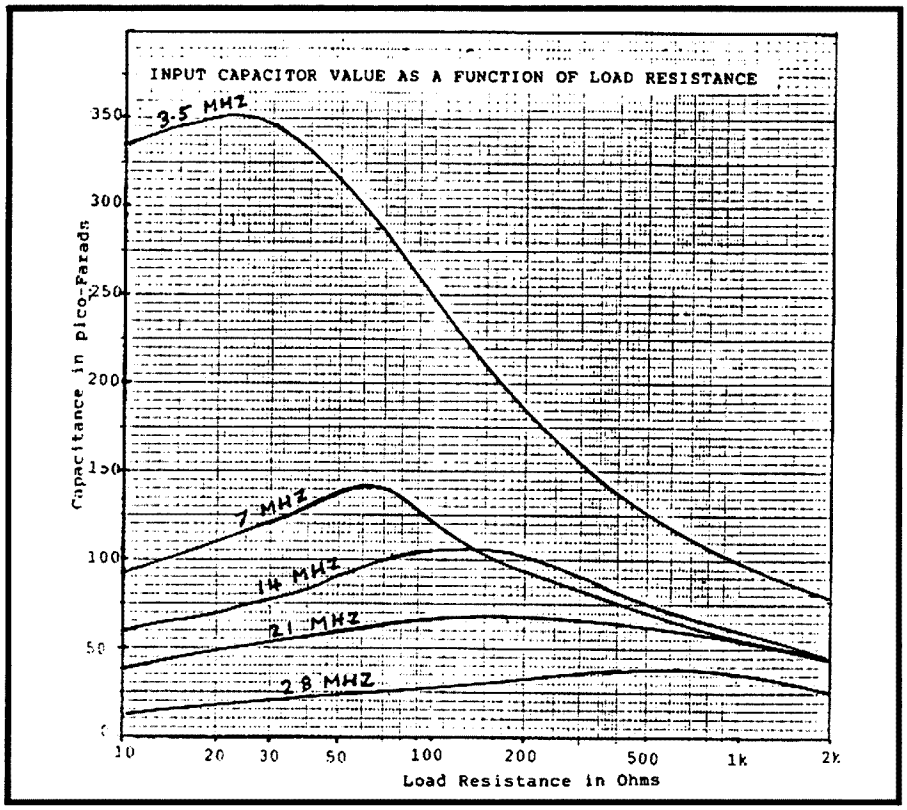


Figure 4 Input capacitor matching

Performance

Tests on the single coil Z match units have been carried out at 3.5, 7, 14, 21 and 28 MHz. Initial load impedance tests were carried out by loading the output with incremental values of resistance between the range of 10 and 2000 ohms and adjusting the Z match tuner for correct match. To set up for a match, a noise bridge with its output connected to a receiver was loaded with 50 ohms resistance. With the receiver set to the required frequency, the noise bridge was adjusted for a balance indicated by the noise null. The 50 ohm resistance was then removed and replaced with the input of the Z match tuner.

With the controls of the noise bridge unchanged, tests on each selected load resistance were carried out by adjusting the two variable capacitors for a match as indicated by the noise null. The variable capacitor dial readings were logged against each load resistance tested. Calibration of capacitance measured against dial readings later allowed conversion of dial readings to direct capacitance. Using the above procedure to obtain the readings, calibration curves for the unit of figure 2 have been compiled.

Figure 4 plots the series capacitance required for each frequency measured over the resistance load range of 10 to 2000 ohms. Figure 5 plots the capacitance required in each half of the split stator capacitor for each frequency over the same load range. From these we see that the input capacitor tuning range is around 20 to 350 pF and the split stator capacitor tuning range is around 20 to 250 pF per side.

A very interesting observation in figure 5 is that we require much more capacity across the coil for 14 MHz than for 7 MHz, the lower of the two frequencies. This clearly shows that at 14 MHz we make use of the upper frequency resonant range with less inductance whereas at 7 MHz we make use of the lower frequency resonant range with the full inductance.

The idea of the Z match tuner is to interface with a wide range of complex impedances as exhibited by all sorts of odd lengths of antenna

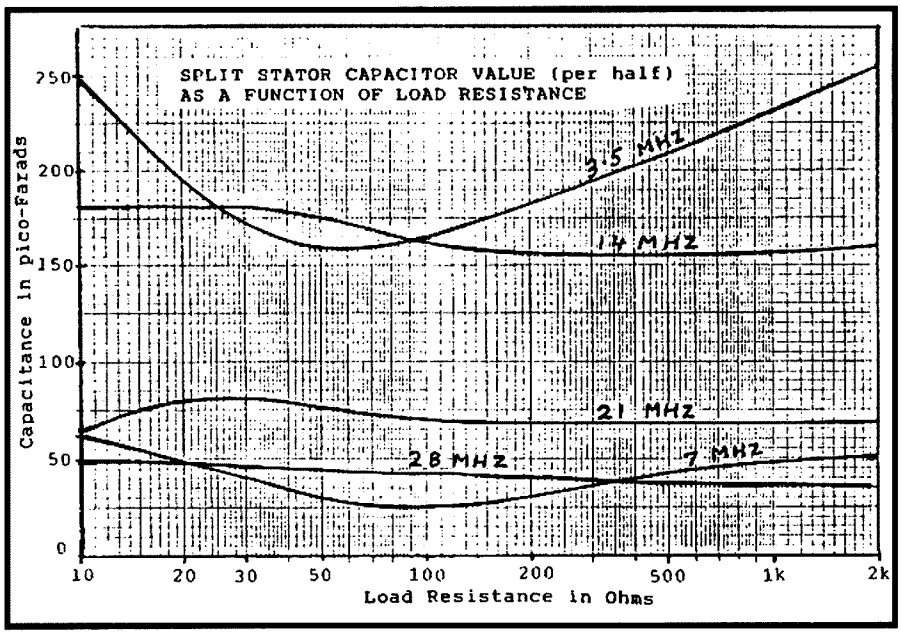


Figure 5 Shunt capacitor matching

wire. This means it must match loads which include a considerable reactive component. Possible combinations of reactance and resistance are numerous but some sort of check is needed to assess the performance of the tuner with reactive loads. For my tests I used a fixed 50 ohm resistance in series with various reactances in the range of minus 1000 ohms to plus 1000 ohms.

At frequencies of 3.5, 7, 14 and 21 MHz, I was able to match the load for the complete test range. At 28 MHz, I was able to match for around minus 250 ohms to plus 800 ohms. The capacitance settings over the test range for the input capacitor and the split stator capacitor have been plotted in figures 6 and 7 respectively. These particular curves have been joined up from a limited number of plot points and hence are not guaranteed to be too precise. I did not include 28 MHz as I had some doubt about the validity of the readings considering the small capacitance values I had to use in the load for this band.

In introducing reactance into the load, the matching system must correct for this and obviously something must be retuned as shown in figures 6 and 7.

What is interesting in figure 6 is the dramatic fall in the value of series input capacity when reactance is introduced. This is particularly noticeable at the low frequencies. As part of the "L" matching network, the input capacitance must decrease when load resistance is increased. Hence, adding reactance to the load also increases the resistive component reflected across the network and possibly makes it easier for a match when the load resistance is low.

Measurement of percentage power loss in the single coil Z match tuner, for a complete range of load conditions, would have been a mammoth task. Hence, power loss measurement was limited to a load of 50 ohms resistance. To carry out this measurement, the transmitter was

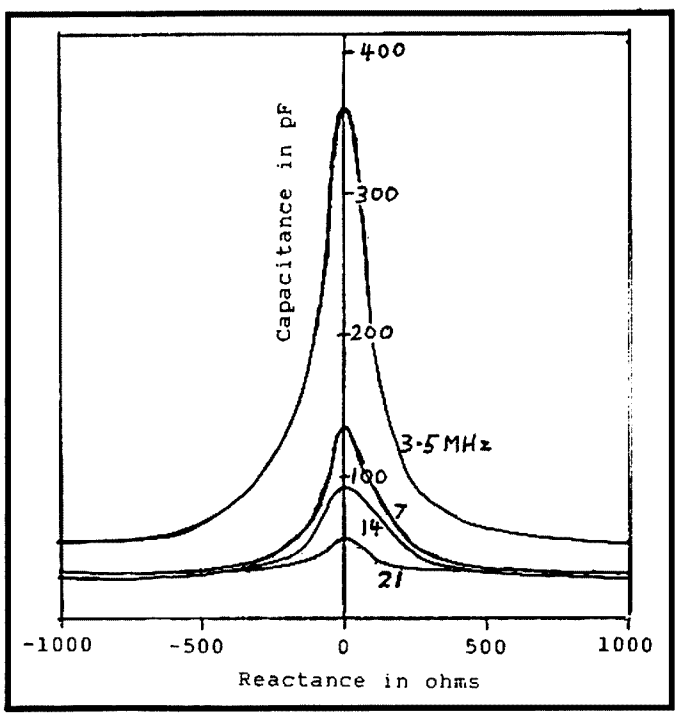


Figure 6 Input capacitor matching for different values of reactance in series with a 50 ohm resistive load.

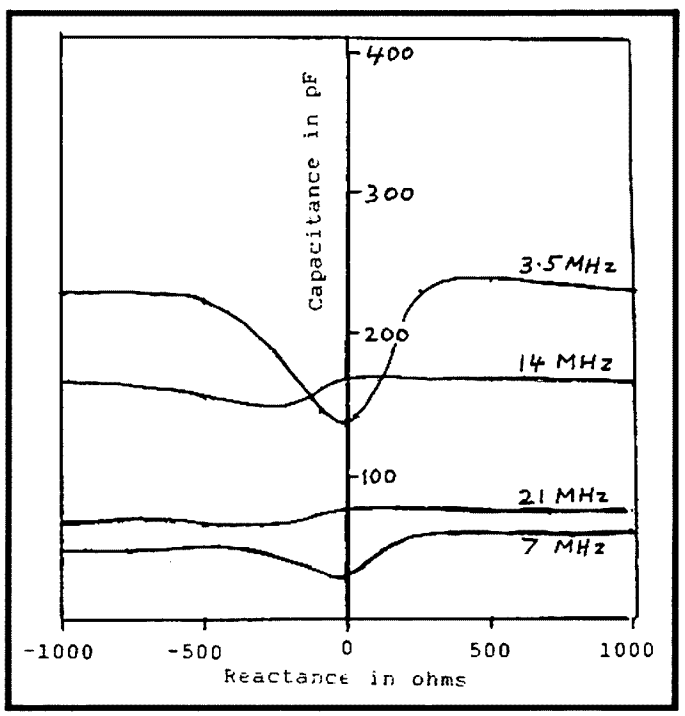


Figure 7 Shunt capacitor matching for different values of reactance in series with a 50 ohm resistive load.

firstly fed directly into a Marconi RF power meter which incorporated a 50 ohm dummy load. The power measurement was recorded and the meter was then fed via an SWR meter and the tuner. The latter was adjusted for lowest SWR and the transmitter was checked to see that its loaded condition was the same as before. A second power measurement was recorded and percent power loss was derived from the two results.

I was unable to detect any appreciable power loss at 3.5, 7, or 14 MHz. At 21 MHz, loss appeared to be in the region of 10% to 15% and at 28 MHz in the region of 20% to 25%. In all fairness to the single coil Z match, similar losses at the highest frequencies were also found in the two coil Z match (refer my report Amateur Radio, December 1990).

1.8 MHz

The Z match unit under discussion was never meant for operation at 1.8 MHz. However, it can be made to work on that band by adding capacity to the two tuning components. Figure 8 shows the total input and total shunt capacitances required to make it work for various values of load resistance. As far as shunt capacitance is concerned, this is only added to the value across the full coil and nothing is added at the coil centre. The curves are plotted for the complete load range of 10 to 2000 ohms although for most of us, with electrically short antennas on this band, resistance above 50 ohms is probably irrelevant.

The addition of three fixed capacitors and a 4 position switch as shown in figure 9 gives the whole load resistance range at 1.8 MHz. If satisfied with just the lower resistance range, two fixed capacitors and a two position switch would do the job. To check operation, I used ordinary 350 volt mica capacitors. With these fitted, I fed over 200 watts from my aging FTDX401 through the tuner into a dummy load and later into my 1.8 MHz antenna. Nothing arced or blew apart but I strongly suggest higher voltage capacitors if they can be obtained.

I wondered whether the high C to L ratio used on this band might result in lower efficiency in the tuner but a power efficiency check, with the 50 ohm load, did not reveal any appreciable losses.

A PVC Tube Model

At the time of almost completing this report, I received from my Melbourne colleagues, the latest version of the Z match coil assembly formed with PVC tubes. As I mentioned earlier, they have been experimenting with an assembly which is hopefully easier to construct. The primary inner coil is wound on one piece of PVC tube with a second larger piece, containing the secondary coil, slipped over the inner winding. The construction is such that the coil dimensions and coil spacing are close to those of our perspex plate coil assembly which has been evaluated in this report. Precise details will not be dealt with at this stage as it is intended that an article on the finalised form will be forthcoming in an issue of Random Radiators.

As received, the primary coil had the required 14 turns with provision to tap at the selected points of 7 and 10 turns but the secondary was fitted with 7 close wound turns instead of the 4 as in the perspex plate version. With this arrangement, I found gaps in the load impedance range so I rewound the coil with 4 turns spaced to around 24mm as in the other version. As far as the windings

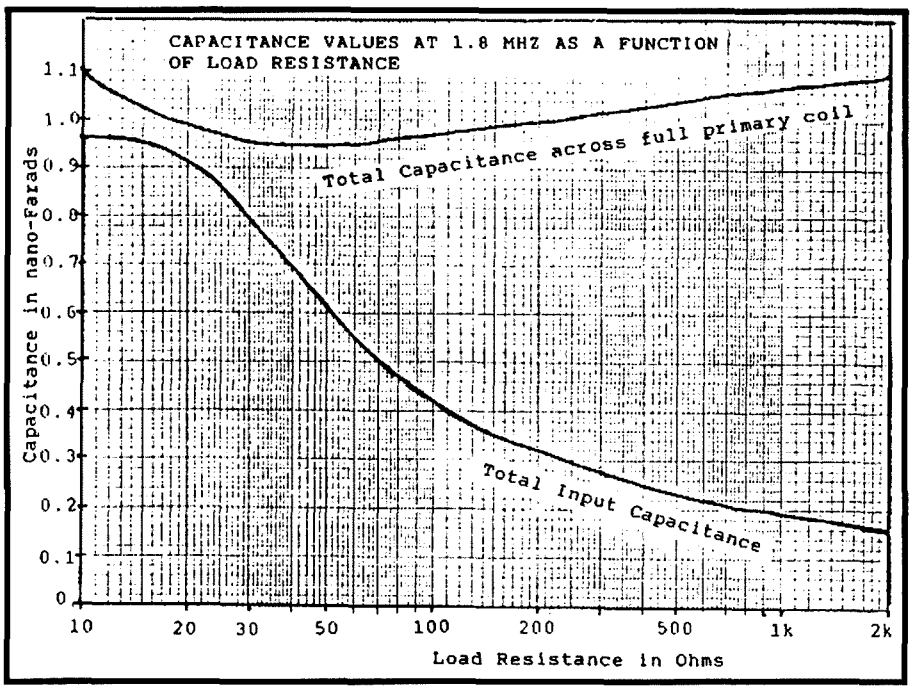


Figure 8 Matching capacitances for 1.8 MHz.

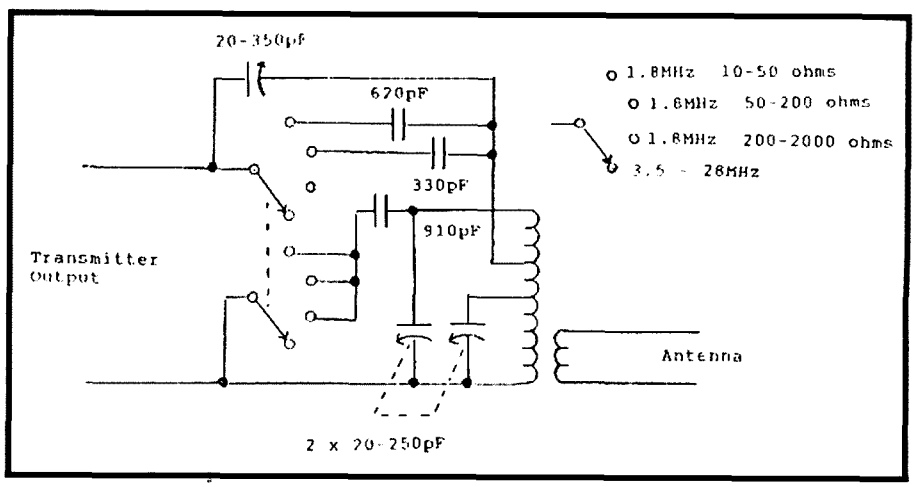


Figure 9 Z Match Circuit with additions for 1.8 MHz.

themselves were concerned, the two coil assemblies were now near identical and I was able to make a direct comparison of load resistance range.

The curves for the PVC tube model followed the same general format as the other, with some deviations, but satisfying the required range. One noticeable effect was the reduced value of capacitance needed for a match in the shunt circuit of the PVC tube model. The curves of figure 5 were in effect shifted some 10 to 15 pF downward. My only concern about this was the load resistance point around 100 ohms for 7 MHz.

Referring to figure 5, we see that at this point the capacitance required is 25 pF. With the curve shifted down, we could well be limited by the minimum capacitance of the variable tuning gang. The question is what caused this tuning shift? I could not see how the inductance could have changed by any appreciable amount so I have had to assume that the dielectric constant of the PVC (much higher than air) has increased the distributed capacity in the coil. In our perspex plate assembled model, the core is mainly air.

Even if an exact match cannot be achieved at this one point, it is only one point and in practice it would probably go unnoticed. If the minimum value of capacitance in the tuning capacitor is really a concern, a correction can be made by slightly reducing the circuit inductance. This is done by placing a short circuit across turns 13 and 14 of the primary coil. I anticipate that in practical application such a modification will be unnecessary.

At low frequencies, there appeared to be little difference in power efficiency between the PVC tube model and perspex plate model. I experienced some difficulty in interpreting my power measurements on the two highest frequency bands but at 28 MHz the measurements did indicate a lower efficiency in the PVC tube module. PVC is not renowned for its high frequency characteristics and perhaps the measurements indicated losses in that material.

Capacitor plate spacing

In selecting the tuning capacitors some consideration should be given to spacing between the plates. This requirement can be worked out now that we have produced the curves of figure 4. We can easily calculate that when matched to present 50 ohms at the tuner input, the peak voltage is 100 for 100 watts of power and 200 for 400 watts of power. The voltage across the tuning system is equal to that voltage multiplied by the value of loaded Q and the loaded Q is derived by dividing the reactance of the input capacitor by 50 ohms. We now look at figure 4 and select a point where the capacitance and frequency calculates to give the highest value of reactance in the input capacitor. This produces a reactance of around 580 ohms at the highest load impedance for 3.5 MHz and a calculated loaded Q equal to 11.6. Multiplying the peak input voltage by this value, we get a maximum voltage of 1160 for 100 watts of power and 2320 for 400 watts of power.

The above calculation is based on the input capacitor being connected to the top of the coil as in figure 1. In our circuit of figure 2, the connection is tapped down and I think we have to allow for a 40% increase in the calculated voltage across the split stator capacitor. On the other hand, allowing for the fact that the

calculation was made on a worst case sample of Q, we might work on a little over 1000 volts for 100 watts operation and a little over 2000 volts for 400 watts operation. For this we need capacitor plate spacing of not less than 0.25mm at 100 watts and 0.5mm at 400 watts. Old receiver tuning gang capacitors are commonly found with around 0.25mm of spacing and hence are good for 100 watts in the Z match tuner. Capacitors with spacing of 0.5mm or greater, suitable for 400 watts, are harder to locate but are often found at our radio trading marts. However, to obtain our required 250 and 350 pF in this wide spacing can be a problem.

Conclusion

The idea of using a single coil assembly with two resonant states, to form the shunt element of a "L" match circuit, has been well proven. In the form of our familiar Z match it can be made to match a wide range of load impedances over a wide range of frequencies. Tests on our particular sample have produced results equal to those previously obtained from a two coil Z match but with the bonus that it is simpler to construct and with no switching, has only two controls to adjust.

Coil arrangements for the Z match, other than our discussed sample and which have different inductance and different coupling arrangements, can be made to work. However, unless the particular design is checked over a load range as I have done, overall performance is an unknown factor. I suggest, that unless one is prepared to go through the test procedure and trim the coil as required, the safe thing to do is to stick with the coil design as described.

Our tests have been carried out on a single coil Z match unit with what is virtually an air wound coil assembly held together with a perspex plate. This assembly is the same as that which has traditionally been used in two coil Z match units. Properly constructed, it looks nice and is efficient. You might choose to build this assembly or try out a different idea such as the PVC tube method we have briefly discussed.

The ideas team in Melbourne are working on all of this and we can expect to see more of the construction detail in the Random Radiators column.

References

1. T.L.Seed ZL3QQ. A Single Coil Z match Antenna Coupler, Break In, March 1982.
2. Random Radiators (VK3OM & VK3AFW). A New & Better Z Match. Amateur Radio, August 1992.
3. Random Radiators (VK3OM & VK3AFW). The "AR" Single Coil Z Match, Amateur Radio, February 1993.
4. Lloyd Butler VK5BR. Analysis of the Z Match Antenna Tuner, Amateur Radio, May 1989.
5. Lloyd Butler VK5BR. Tests on the Compact Coil Version of the Z Match Tuner, Amateur Radio, December 1990.

© 18 Ottawa Avenue Panorama SA 5041

ar

Remember to leave a three second break between overs when using a repeater.

WIA News

More Good Publicity for Amateur Radio

Well-known Sydney amateur, Ian O'Toole VK2ZIO, scored some very positive publicity in February in the *Hills Shire Times*, a local area newspaper covering the North and Western districts of Sydney.

The story, written by reporter, Peter Gladwell, covered Ian's interest in restoring old military radio communications equipment. The lengthy story included a photograph of Ian and his son Andrew, with a Type A Mark III portable transceiver of WWII vintage.

Probably the best quote from the story was this: "The biggest difference between amateur radio and CB radio is the fact that we have a large possible variety of things you can do, where on CB you can only talk to someone else."

The piece also gave details of amateur radio classes conducted by Ian, along with his phone number.

Then, in the March issue of *PC User*, Matt Howard contributed a lengthy piece on digital communications in amateur radio, concentrating on packet radio.

Matt gave some background history and details on the AX25 protocol. He discussed the setup at his own station, including costs of transceivers and packet components.

At the end of his article, Matt referred interested people to the WIA for details on contacting a local club, and praised the NSW Division's correspondence course which he used to study for his licence.

HFC* Regulated Variable Voltage Power Supply

Another great construction project from Drew Diamond VK3XU **

For experimental radio and electronics work, particularly with MOSFET and other solid-state power amplifiers, there is a need for a regulated dc power supply, variable from less than 5 V to about 25 V at up to 2 A. A search of local journals did not reveal a simple design which would reasonably suit. Supplies of 12 V or 13.8 V seem to be pretty well catered for, and the 3 to 18 V area also. The following supply is offered as a reasonably cheap and effective solution to this perceived gap.

Circuit

The well-known and proven LM723 performs the regulating function. The internally generated 7.2 V reference at pin 6 is halved to 3.6 V and applied to the error amp non-inverting input at pin 5, thus establishing the minimum output at about 4 V. Error signal from the output voltage divider is applied to the inverting input at pin 4. The '723 can only supply up to 100 mA on its own, so the output current at pin 10 drives a 2N3055 (or similar) power transistor as series pass regulator element.

The voltage applied between pins 2 and 3 controls the current availability. So, as the voltage approaches 0.6 V dropped across the series sampling resistor, the supply will go into constant current mode. Greater or lesser current capacity can be obtained by changing the value of series sampling resistor; 0.25 ohm will give about 2 A, 0.5 ohm will give 1 A, 1 ohm 0.5 A and so on. If a sufficiently rated transformer and '3055 heatsink is used, the series resistor may be reduced further to obtain a higher current output accordingly. The circuit shows examples of values of series resistor and resultant current limits available.

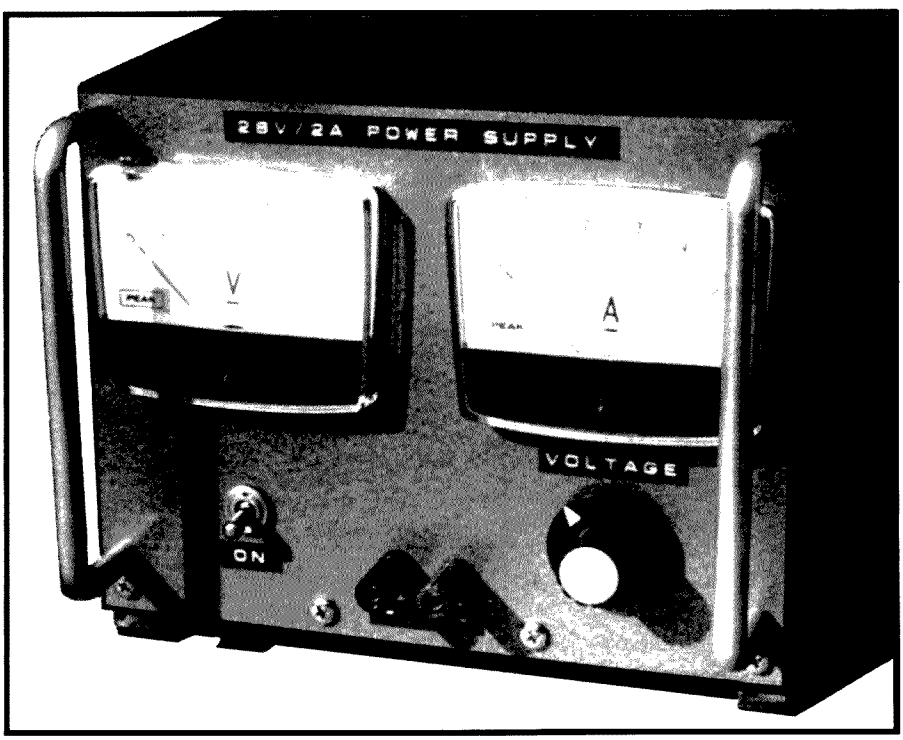
The transformer secondary voltage is about 28 V, current rated according to requirements. 10 A bridge rectifier and filter capacitor supply the "raw" dc supply of about 34 V under full load. When the supply is switched off, the filter capacitor is discharged through the 1 k 5 W bleed resistor.

Any tendency to self-oscillation is suppressed by inclusion of the 560pF ceramic capacitor between the HF compensation pin, and the invert input pin. Stability is further improved by the addition of the 47 μF electrolytic right at the output terminals. RF energy is effectively discouraged from entering the supply with the inclusion of the 0.1 μF ceramic.

With a bench supply, there is always the possibility of reverse voltage being accidentally applied (eg in battery charging), and inductive loads may "kick back" a voltage spike when disconnected, so it is prudent to include a hefty diode, reverse connected, right at the output terminals, and a series diode to prevent external voltages reaching the regulator should mains voltage be removed.

Performance

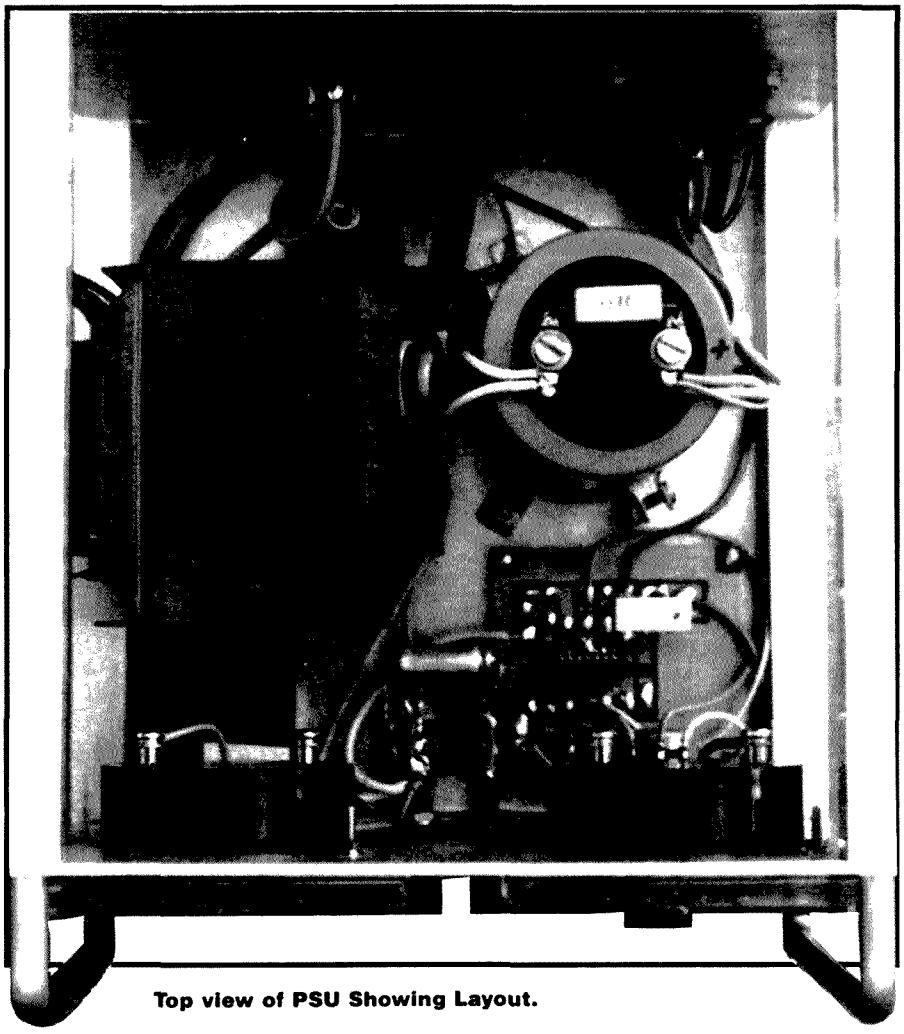
Voltage Range:	4 to about 28 Vdc (see Options).
Current Capacity:	2 A (see Options).
Load Regulation:	Within +/– 10 mV from no-load to full-load.
Line Regulation:	Within +/– 10 mV for +/ 10% change in mains voltage.
Ripple and Noise:	Less than 8 mV p-p.
Output Protection:	Short circuit and reverse polarity.



HFC Power Supply.

Options

What follows accounts for the "horses for courses" of the title. The minimum output voltage is fixed at 4 V, which can easily be changed to any value up to about 8 V by juggling the ratio of the two series resistors at pins 5 and 6, or 8 V can be made the



Top view of PSU Showing Layout.

minimum simply by connecting pins 5 and 6 direct.

If voltages as high as 28 V. are not required, say for example you only need to work up to 18 V, then an 18 V. transformer should suit. The maximum voltage which may be applied to the '723 is 40 V, so for outputs higher than about 30 V, the '723 must be supplied from a lower voltage.

If it is required to vary the current limit, the series resistor may be wired as a "string" with a switch to select the appropriate resistance, stepping from (say) 0.1 ohm for 5 A, to 2 ohms for 250 mA.

No over-voltage protection is provided. In the unfortunate event that the '3055 goes short between collector and emitter, the full output voltage may be applied to the load. If over-voltage protection is required, the reader is pointed to References (2) and (3), where suitable adaptable circuits will be found.

A fuse, rated at the maximum current required, may be wired in series with the raw dc output, between the positive terminal of the filter capacitor, and the collector of the '3055. If the '3055 does fail under extreme conditions, the fuse will blow and prevent any further current flowing into the load.

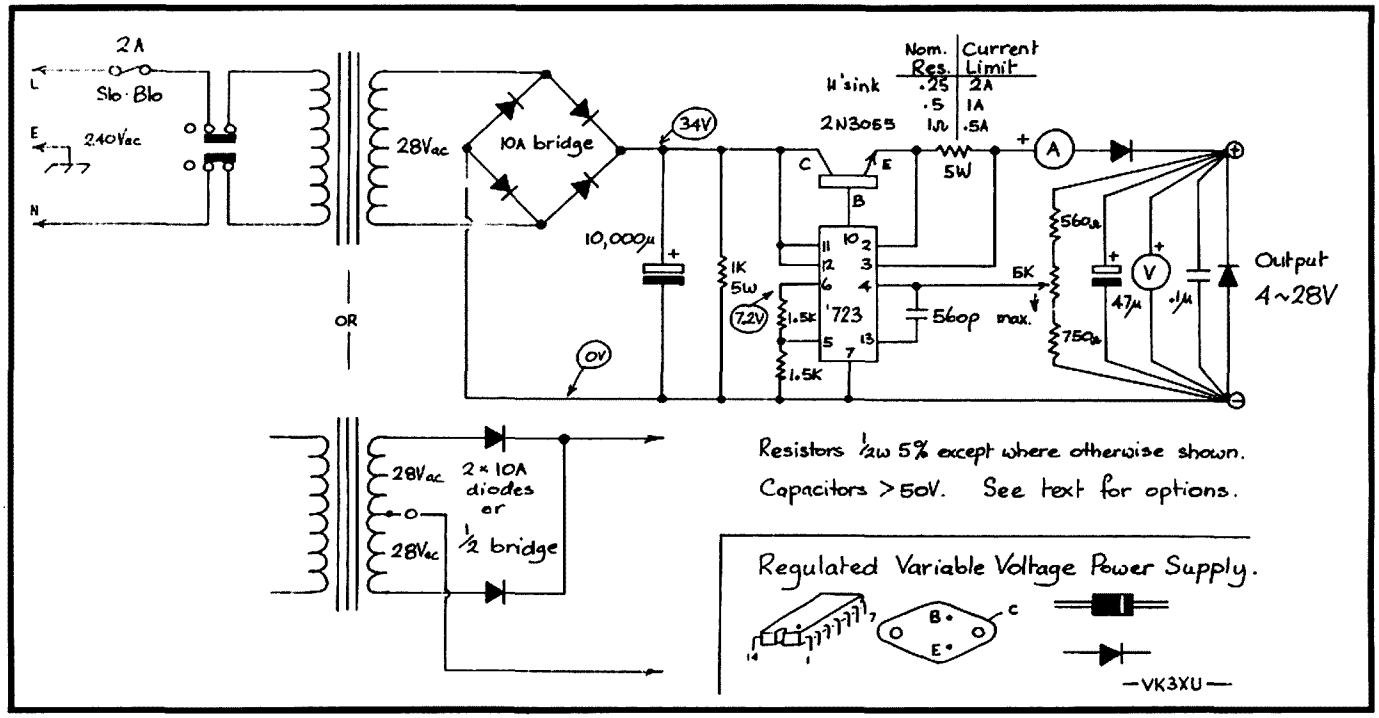


Figure 1 — Regulated Variable Voltage Power Supply (VK3XU).

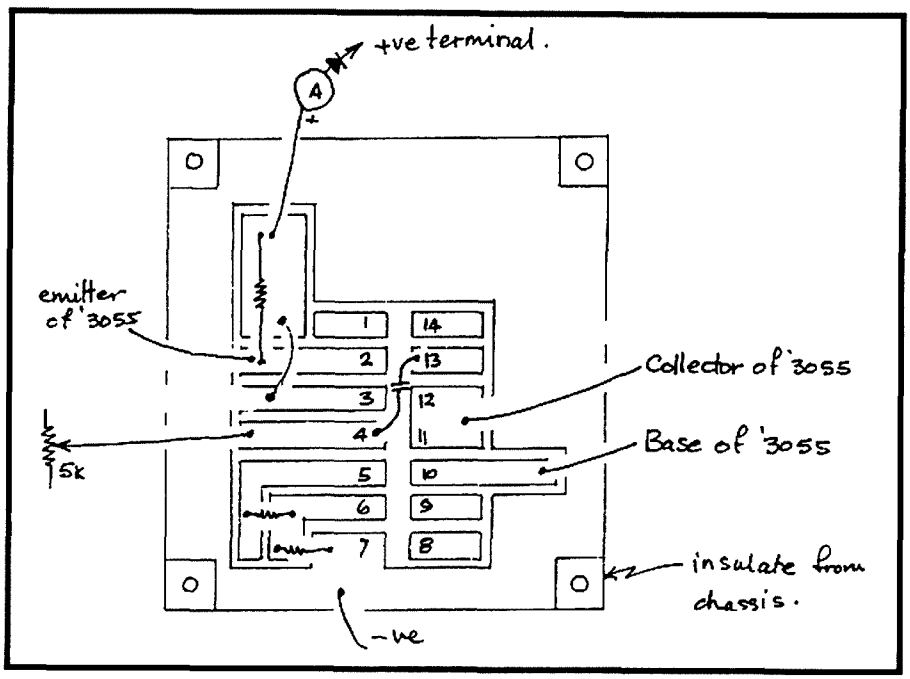


Figure 2 — LM723 Component Locations.

For an "on" indicator, wire a LED in series with a 1 W resistor of about 2.2 k across the filter capacitor.

Switching transients from the bridge may reach sensitive equipment and cause line buzz. If this is a possible problem, connect a 0.01 uF/100V+ ceramic across each diode of the bridge, and from each output terminal to chassis ground.

Construction

The most costly component would probably be the transformer, if needed to be purchased new. However, this aspect has been addressed, and the reader is pointed to Reference (1) where will be found a valuable article on how to re-wind an old TV transformer for a similar supply. The transformer is not critical, a secondary in the order of 28 Vac at about 2 A (or whatever current is required) would be fine. The usual electronics suppliers have some 56 Vac centre tapped transformers, so a simple two-diode arrangement will be required with these (as shown on the circuit). Note that if a 56 Vct transformer is rated 2 A, then it should be possible to supply 4A dc in this instance, because each side of the winding only supplies current for one half cycle. Also available, for about half the cost, is a 30V/2A unit, which should suit a 1 or 2A dc supply.

My own application needed a fairly rugged assembly, so 3 mm thick aluminium sheet was used for front and back panels, connected with 15 mm square section rod as shown. Any substantial ready made, or home-made box would serve, depending on individual resources and needs. The rear panel also functions as heat sink for the '3055, which is mounted with the appropriate TO3 hardware. Both sides of the insulating washer must be smeared with heatsink compound. An insulated cover should be placed on the '3055.

The circuit shows schematically that the output voltage divider should be wired directly across the output terminals in accord with standard practice, thus considerably improving the voltage regulation characteristics.

A small circuit board accommodates the '723 and associated components. A 14-pin wire wrap socket greatly offsets any "fiddliness" of the layout for this component. Any other wiring method, such as matrix board, Vero, ugly etc may be employed as desired.

All mains terminations must be adequately covered to prevent accidental contact, and mains earth must be connected to chassis ground with a dedicated lug. Due to the low impedance of the transformer primary, a normal fuse may blow on switch-on, so a "slow-blow" fuse will be necessary.

Testing

Check all wiring, and that polarised components are correctly located. Remove the '723 from its socket, then switch on. No output voltage should be indicated on the voltmeter. With your multimeter, measure the voltage across the filter capacitor; it should read about 1.3 times the transformer secondary voltage (eg 36 V). Switch off, and allow the capacitor to

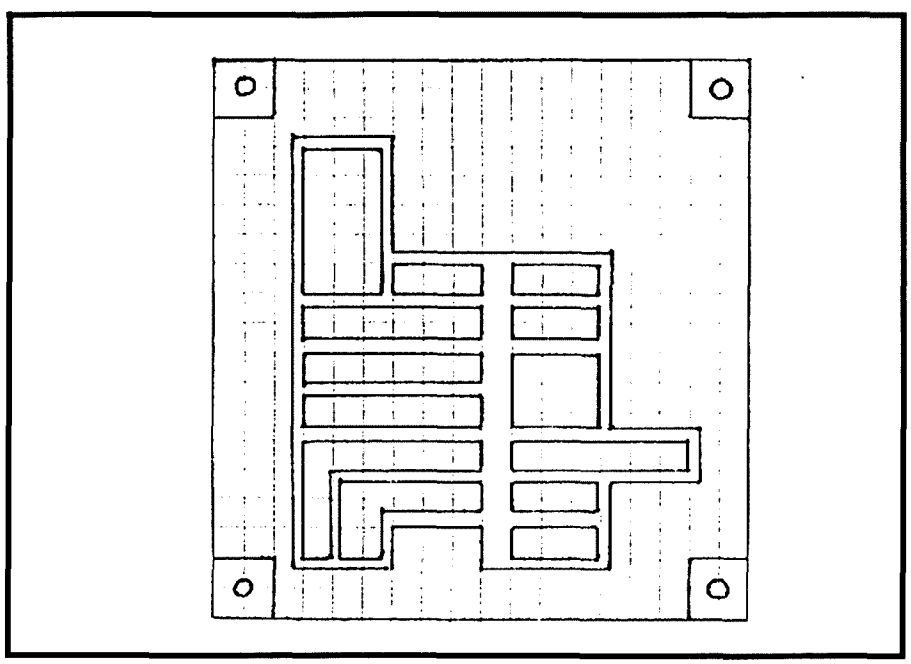


Figure 3 — Circuit Board Artwork. (Twice full Scale).

discharge. Insert the '723, then switch on. You should be able to vary the output from about 4 V to 28 V. Connect a load of suitable resistance and power rating (a combination will probably be required). At full load current, the output voltage should not change by more than 10 mV. Check at various voltages and appropriate load values.

Poor or erratic regulation may indicate oscillation. The value of C between pins 4 and 13 may be increased (try 1000 pF) until satisfactory regulation is obtained. Capacitors should not be connected to any other IC pins, as these will probably degrade stability. Check also that the unregulated input voltage is always at least 6 V higher than the expected output voltage; ie there is sufficient voltage reserve available.

After a period of operation at low output voltage/highest current, the "3055 will become moderately hot, but certainly it should not routinely be allowed to get "stinking hot'. Fit additional heatsinking if this is a problem.

If your supply will not work satisfactorily for some reason which cannot be figured out, or further information is required, please write to the author at the address above. An SASE for reply would be appreciated.

References and Further Reading

1. Home-Brew Regulated Power Supply- Greenham, VK3CO, AR July '85.
2. 28V High Current Power Supply- Any recent ARRL H'book.
3. Shunt-Protected Power Supply- Hartkopf, VK3AOH, VHF Comms Winter '89.
4. 18V/1A Benchtop Supply- Evans, EA Aug. '91.
5. The Art of Electronics- Horowitz & Hill, Cambridge University Press.
6. 13.8 V Power Units- Hatch, G3ISD, Rad Com July '83.

Parts List

Resistors:

0.25 or 0.22 ohm 5 W (for 2 A).
560 ohm 1/2 W 5%
750 ohm 1/2 W 5% (or two 1.5 k).
1 k 5 W.
1.5 k 1/2W 5% (2).
5 k lin. pot, or preferably; 2 x 10 k dual pot with gangs wired in parallel.

Capacitors:

560 pF ceramic, 50 V.
0.1 μF ceramic, 50 V
47 μF electrolytic, 50 V.
10,000 uF (minimum), 50 V.

Semiconductors:

10 A, 100 V bridge (or 4 diodes).
Motorola or "brand name" 2N3055.
LM723 IC
5 A+ diodes (2) required for output protection.

Miscellaneous:

Case to suit or material for same, transformer, heatsink (if additional req'd), DPDT mains switch, fuse and holder, appropriate Volt and Amp meters, 14-pin DIL socket, circuit board material, red and black output terminals, hook-up wire, mains power lead.

* *Horses For Courses*
** *"Narr Meian", Gatters Road, Wonga Park Vic 3115*

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of January 1993 (we regret that this list was omitted from the March 1993 issue).

L20906	MR R T HEATON
L20908	MR A KAVANAGH
L20910	MR J A RYAN
L20911	MR S NORMAN
L20912	MR D THOMAS
L20913	MR P TITZE
L20914	MR F A GUBBINS
L30832	MR E ANDOR
L30834	MR D ROGERS
L30835	MR R I MORGAN
L40340	MR J E BURGESS
VK1ZTM	MR R L WAITE
VK2DHM	MR F MIKE
VK2GOL	MR H K GOLDHOFER
VK2GUX	MR C LUCKMAN
VK2GVQ	MR P BULANYI
VK2XNZ	MR B S FURBY
VK3MIR	MR C A BISHOP
VK3MIZ	MR I BLEZARD
VK3MJF	MR K JENKINS
VK4BL	MR R K BROWN
VK6JB	MR A F WAHL

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of March 1993.

L10149	MR R COLLMAN
L20923	MR F W GROSS
L20924	MR P JOHNSTON
L20925	MR D J MARTIN
L20926	MR D BARRY
L20927	MR B J LATTA
L20928	MR G A MCGILVRAY
L20931	MR D J NURSE
L30837	MR L M DUGDALE
L30838	MR A KRINOV
L30839	MR P RICHTER
L30841	MR E O KRISTA
L40342	MR R P CHATTERON
L50610	MR J C SUTHERLAND
L50611	MRS J HARRIS
L60320	MR A D MASSHEDER
L60321	MR R N MAY
L60322	MR P A PHILIPS
L70111	MR R B FINLAYSON
VK2AD	MR S BRUCESMITH
VK2AMJ	MS M E JACKSON
VK2ASZ	MR A S ALFORD
VK2AZQ	MR A HAVYATT
VK2CRB	MR R BENFATTO
VK2DAA	MR G A HILL
VK2DSL	MR S W LINTON
VK2KIS	MR G C PROUT
VK2MEC	MR A S MUELLER
VK2MMR	MR D M COOKE
VK2TAC	MR G FAULKNER
VK2TBO	MR H E DYER
VK2TPP	MR P A THOMPSON
VK2TSR	MR G R BARKER
VK2XXK	MR A RUNIEWICZ
VK2YRX	MR R W WALKER
VK3AYZ	MR R CASSIDY
VK3DDU	MR P HOLMES
VK3EXJ	MR R W ROBERTSON
VK3KAB	MR D WILLIAMS
VK3LRE	MR R J ELDGRIDGE
VK3MJH	MR C CLARKE
VK3NIM	MR J NOCKER
VK3TAZ	MR J LIDDELL
VK3TPO	MR E K PETER
VK3VCF	MR C FINNIE
VK3YGA	MR G APRILE
VK4KGT	MR R C FYSH
VK4PWN	MR M MERRYLEES
VK5BZ	MR C B ZERBE
VK5MAB	MR A W BUTLER
VK5SX	MR R W C KOPP
VK5ZIF	MR I M FRASER
VK6DX	MR D L SMITHDALE
VK6GRQ	MR C S HEBDEN
VK6XPG	MR P J GROUSE
VK6ZCY	MR R B PENNO
VK6ZGA	MR I C THRELFO
VK7AEM	MR A E MAIN
VK7MD	MR M G FREEMAN
VK8KMA	MR M A PHILLIPS

ar

Monitoring RF Currents

Robert McGregor VK3XZ says this simple circuit can be put together in an hour or so.

Back in the old days RF currents were measured using a hotwire ammeter or a thermocouple ammeter. Both these instruments are rather fragile and difficult to find.

This simple circuit can be put together in an hour or so and is made from junkbox parts.

The pick-up coil can be a simple coil of about 6-8 turns of 16 swg insulated wire wound on a 12mm drill bit. The pick-up coil is placed near the helical antenna to absorb the energy radiated by the antenna.

If you want to monitor RF current in a line, wind the same number of turns on a toroidal core such as FT68-series. The line to be sampled is passed through the centre of the core to form the primary winding of the current transformer.

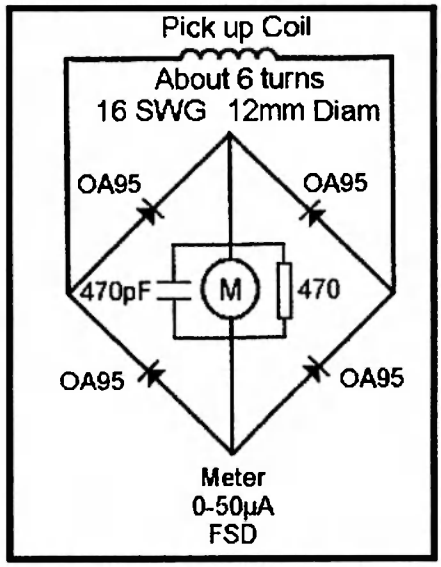
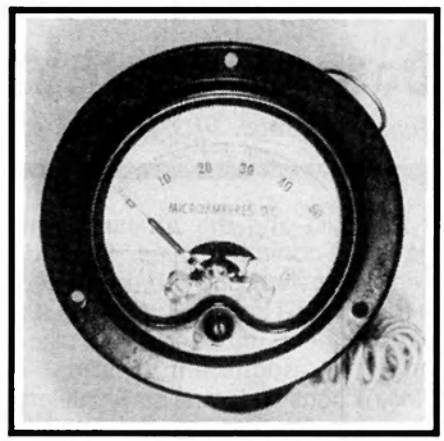


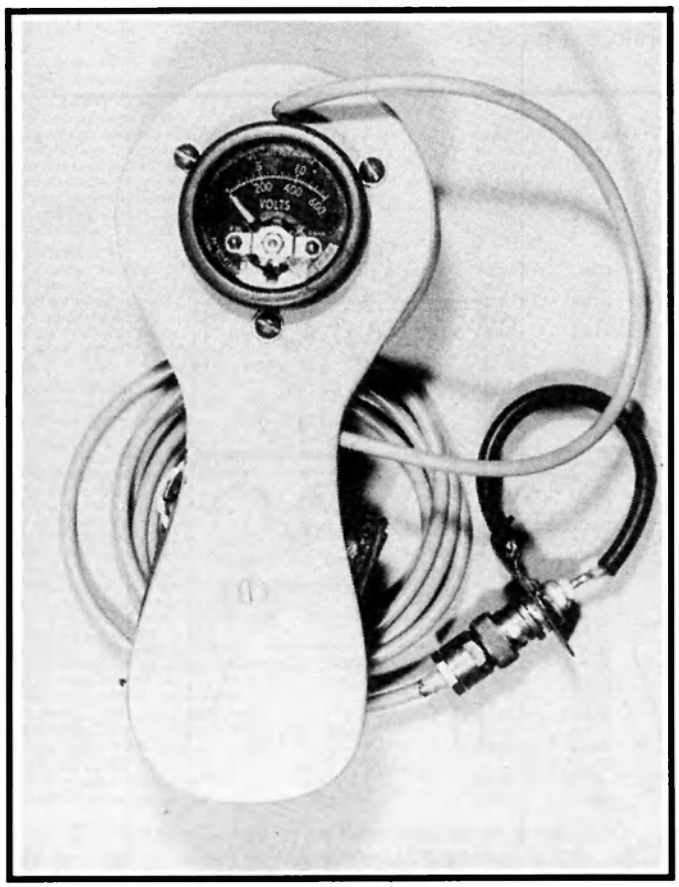
Figure 1 — RF Probe Circuit Diagram.



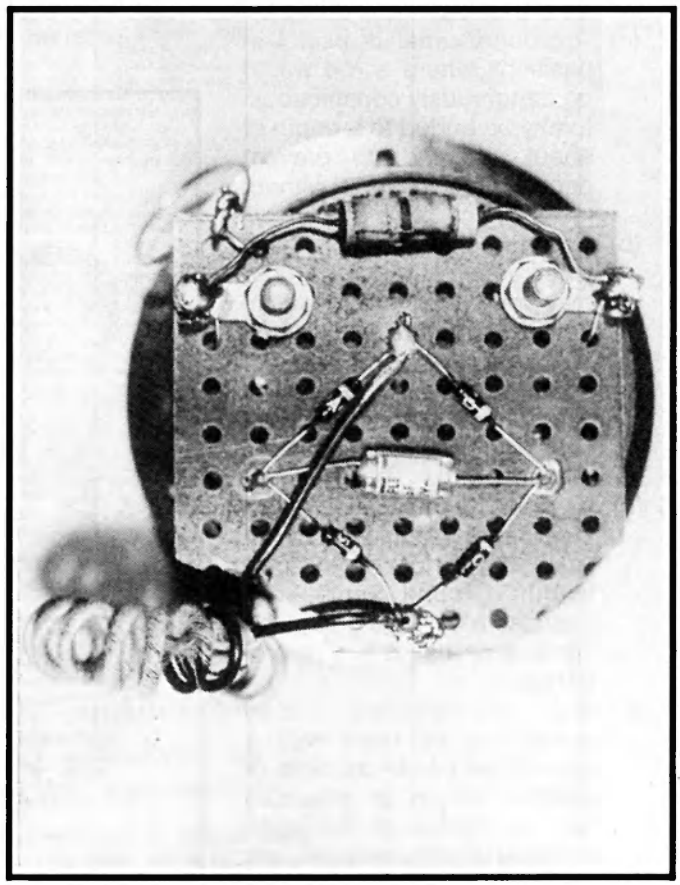
Front view of meter, components are mounted at the rear.

The photographs are of two such RF monitoring probes. Remote sampling can be achieved by joining the inner and outer of a piece of RG58 together at one end, then connect the inner to the centre pin of a BNC connector as shown. This loop can be used to monitor RF in multipliers and output stages of transmitters.

ar



RF Probe in home brew housing.



Alternate construction method — rear view of meter with components attached.

Down to Earth Antenna

Robert McGregor VK3XZ takes an historical look at a ground aerial.*

Australia and the African Desert have a common need for radio communication and a mainly sandy terrain. VK5TL's letter, AR Jan '92, caused me to dig deep into a pile of ancient documents and in "Instructions to Australian Signallers" there was this piece of information for our guidance. I quote:

1. (a) A ground aerial is a length of insulated wire attached to the aerial terminal of a wireless set and laid out along the ground in the direction of the distant station. Although it lies horizontal, it radiates ground waves; it is thus an exception to the general rule that vertical aerials are used for groundwave working.
   (b) A ground aerial gives approximately the same range as a 6 ft rod.
2. (a) A ground aerial is useful in positions where a rod would be dangerously conspicuous. It may be buried to a depth of about an inch, to prevent people tripping over it, without losing much of its efficiency.
   (b) Ground aerials are less likely to screening than rods, and may provide the only means of getting communication when the sets are in woods or amongst buildings. A station using a ground aerial can work satisfactorily to a station using a rod.
3. (a) A ground aerial radiates well in the direction of its length, but very badly at right angles to its length. Ground aerials are unsuitable for large groups on account of their directive properties.
   (b) A counterpoise may sometimes be used with a ground aerial. It consists of another length of insulated wire connected to the earth terminal of the wireless set and laid out along the ground in the opposite direction to the aerial. When a counterpoise is used, it should point towards the distant station, and the aerial in the opposite, because the radiation will probably be greater in the direction of the counterpoise than in that of the aerial.
   (c) The directivity of a ground aerial may be helpful in attaining a degree of secrecy, since little radiation is sent out at right angles to the aerial.
4. (a) The best length for a ground aerial is:— Distance in feet = (375/Frequency in MHz) (114.3/fMHz) metres). If a counterpoise is used, it should be about the same length.
   (b) These lengths are not critical. If the aerial is short, it will work almost as well; if it is too long, however, the efficiency will be reduced. Therefore a ground aerial should always be made shorter than the best length rather than longer, which means it should be cut for the highest frequency that may be used.
5. Insulation — it is important that the aerial and the counterpoise (when used) should be properly insulated. The most common fault is failure to seal the end of the wire distant from the set."

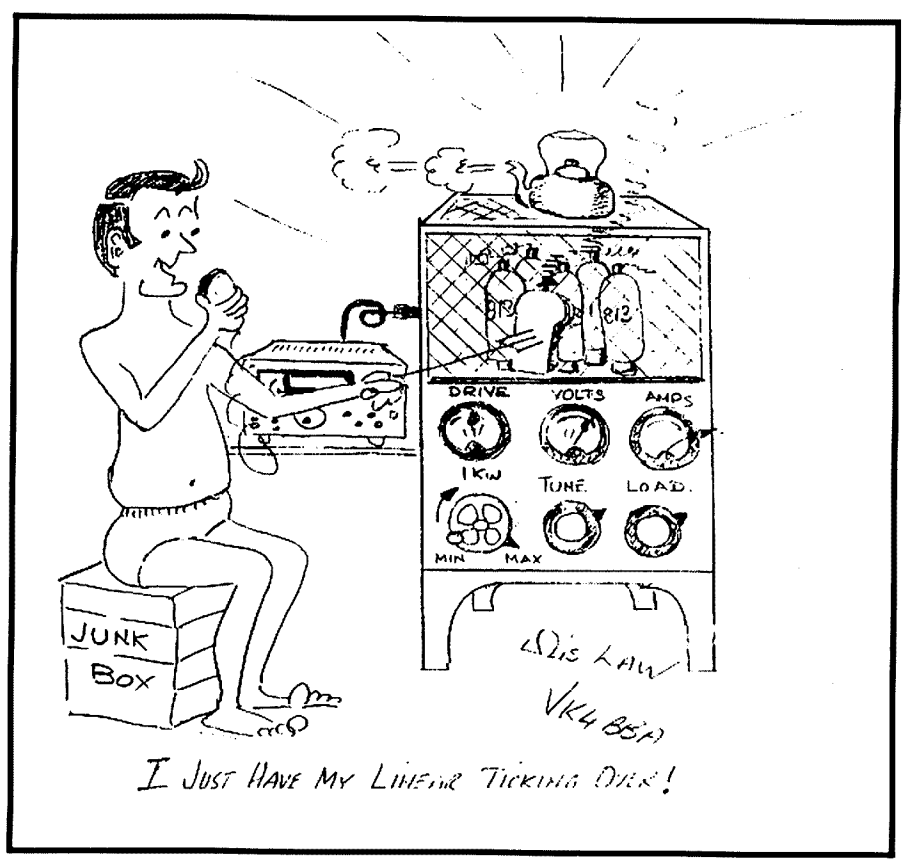
I point out that in all sets referred to, the output circuit was designed to feed into something less than a quarter wavelength. An outboard series fixed condenser was normally available where the available antenna was too long. Frequencies were between 4 and 7 MHz.

Tests over this frequency range showed an average difference of 16 dB between a 6 ft rod and one of 18 ft. Beyond this height, a small capacity hat, four radial rods, 2 feet long, gave the best results.

I hope this piece of historical information is of assistance to the happy band of aerial experimenters.

**2 Wiltshire Drive Somerville Vic 3912*

ar



WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX163	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1988	BX259	$104.00
Easy Up Antennas	MFJ38	$39.25
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX162	$16.00
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Formal	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX028	$49.00
Practical Wire Antennas — RSGB	BX296	$28.00
Reflections — Software 5 inch disk	BX358	$20.00
Reflections Transmission Lines and Antennas — 5 25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$6.60
Smith Charts S/Scale 1 SET co ord Imp/Admir Pack of 10	BX901	$6.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$6.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BATC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$49.95
Radio Call Book North America 1993	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley OTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX286	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX367	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX196	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1978	BX283	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$25.80
Radio Frequency Interference — ARRL — 1992 Edition	BX186	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$18.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1986	BX262	$79.90
Radio Auroras — RSGB	BX361	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$16.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$16.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$36.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing — ARRL	BX386	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX398	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$36.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$16.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX166	$36.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BX167	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX168	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX446	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX365	$40.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX288	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$48.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Car Bumper Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

Random Radiators

with Ron Fisher VK3OM, and Ron Cook VK3AFW.

The Choke Balun

In a previous RR we made reference to a choke balun for use with the G5RV antenna. In this episode we evaluate that balun and discuss choke baluns generally.

Howarth Jones GW3TNP of Ferromagnetic, North Wales (UK), has kindly sent us a sample balun for use with G5RV antenna. More on this unit later.

Choke baluns or current baluns as they are sometimes called are claimed to reduce band noise, TV time base harmonic signals, and TVI by minimizing current flow on the outside of the coax cable braid. Proponents of choke baluns claim them to be superior to the more traditional "voltage baluns". Even the claim of voltage vs current difference can generate an argument, and while we will try to avoid that here we may well ruffle a few feathers.

The traditional balun is designed to provide a load with balanced voltages when driven from an unbalanced voltage source. Often an impedance transformation is achieved at the same time. The current balun in its most common form can be described as a transmission line transformer with a 1:1 ratio for voltage, impedance and current. When wound using a balanced transmission line (this might be a twisted pair of wires) it is usually considered to be a voltage 1:1 balun. The TH series of HF beams are usually fed with such a balun.

If the balun is made using coaxial cable it is called a choke or current balun. So what has changed? Not much really, only the perspective of the user.

Winding the transmission line around a ferrite or iron dust core has no effect on the line impedance if the electric and magnetic fields of the transmission line are confined to the space between the two conductors and no field leakage occurs. This condition is well met by most coaxial transmission lines and to a fair degree by most balanced feeders with close conductor spacing.

No external field means that no interaction with magnetic or dielectric materials occurs. If the currents in both conductors are not exactly equal then they do not achieve external field cancellation. The situation can be described as the feeder carrying two balanced feeder currents in each conductor and a third unbalanced current flowing in one of the conductors. For coaxial cable this current would usually be represented as flowing on the outside of the coax. The unbalance current generates an external field and is thus susceptible to external influences such as iron cores on which the transmission line is wound.

The unbalance current has to flow through an inductance if the cable is wound around either an air cored former or a ferrite rod or toroidal core. It therefore "sees" an appreciable inductance which is not seen by the balanced currents.

The simplest form of current or choke balun is simply a length of coax cable coiled up to provide a substantial inductance at the operating frequency. It is usually placed at the antenna feed point. Because the electric and magnetic fields are almost completely contained between the braid's inside surface and the inner conductor's outer surface, the coiling of the cable has no effect on the normal operation of the feeder.

If for any reason an unbalance current flows it encounters the full inductance of the coiled cable and is "choked". Thus the reason for the name, choke balun becomes obvious. The result is to force the external unbalance current to a small value and to promote better balance of the cable inner currents. The same applies for two wire line systems, however they do have some external fields near the conductors so some change in impedance of the line will occur. Choke baluns tend to be made from coaxial cable probably mainly for this reason.

Instead of winding the cable in coils which are typically 0.2 m or more in diameter and which contain about a quarter wavelength of cable at the lowest operating frequency, the coils can be wound on a ferrite rod or on a large toroid core. This reduces the physical size of the balun considerably, yet maintains the same inductance. Further, instead of winding ten turns on a core the cable can be threaded through ten cores. The result is the same except that problems of trying to bend the cable around a sharp radius are totally avoided and the average flux

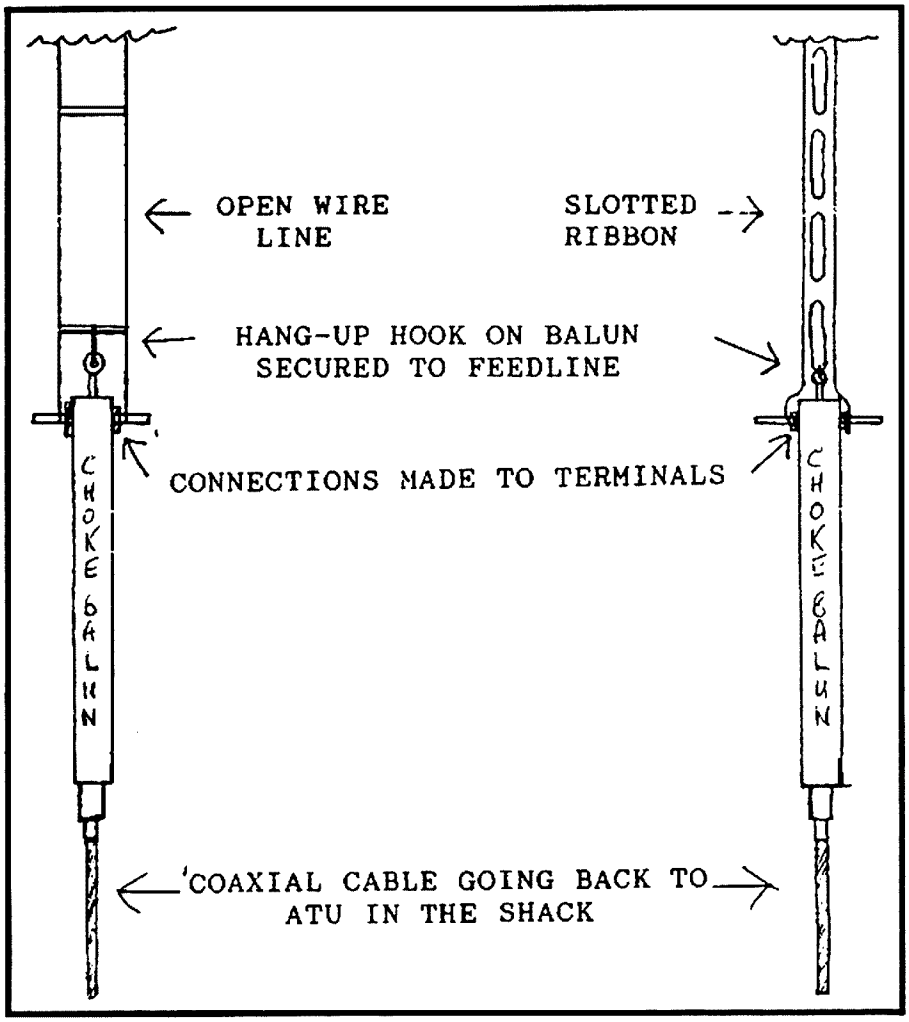


Figure 1 — G5RV Balun Connections.

level from any unbalance current is less in each core than it might be in one single core.

Unbalanced feeder currents can be produced by an asymmetric antenna, such as the Windom, by lack of symmetry in the physical arrangement of a nominally balanced antenna, by objects such as a tree near one half of a dipole and so on.

By minimizing the current that might flow down the outside of the braid, radiation from the feed line is also minimized. This reduces the probability of TVI. Just as the probability of an unbalanced radiating current is reduced so is the likelihood of external fields inducing currents in the braid which then find their way inside the coax and so to the receiver. Thus pickup from nearby noise and interference sources, especially vertically polarized ones, is reduced.

It should be apparent that, if there was no leakage from the coax braid, then putting cores or beads over the cable would not affect the impedance of the cable. Some less expensive cables have measurable leakage due to using a relatively open braid and these may exhibit a detectable impedance change. The effect should not be too serious on HF, but some of the external choke inductance will be "seen" by the inner currents.

Testing

So much for the theory. As one of the two Rons uses a G5RV on HF he was elected (by the other Ron) to test the choke balun supplied. The G5RV in question had, for many years, been fed via a coil of coax containing about 20 m of RG213 cable. This was inclined to drop from its intended place on the side of the tower at the end of the G5RV 300 ohm feeder and be found largely uncoiled on the lawn. This occurred most frequently on the day the lawn was to be cut.

To overcome this problem, a few years back, a balun was made by winding 10 turns of RG58CU around the core of a TV EHT transformer, but it was never weather proofed and hence never permanently installed. The arrival of the choke balun presented an opportunity to compare the three approaches. Because the coax coil was tied to the side of the tower, and so could be coupled to any stray currents in the tower, it was expected that the other baluns would be better: this in fact proved to be the case.

The two cored baluns were fed from a 3 m long length of RG213 cable.

The results are shown in the graphs. The straight coax balun gave different SWR values to the coil of coax but generally very similar results to the homebrew balun. Generally the coil of coax gave lower VSWR, suggesting higher losses, perhaps in part due to interaction with the tower body, resulting in inadequate balun operation. Higher losses could be expected from the additional 20 metres of cable. The homebrew balun gave a much higher VSWR on 10 metres for reasons unknown. With the commercial unit in place the station Kenwood AT250 ATU was able to produce a match better than 1.3:1 on all frequencies inside the allocated bands except on 10 MHz. The ATU could not match properly with the home brew unit on 7 MHz and 10 MHz. This difference is attributed to the different effective cable lengths in the two units.

No graphs are provided for 10 MHz, 18 MHz and 24 MHz because the VSWR did not change across these bands.

On 10 MHz the coaxial coil gave 5:1, and both current baluns gave 100% reflected power. On 18 MHz the coaxial coil gave 5:1 again but the Ferromagnetic balun gave 9:1 and the home brew unit gave 100% reflected power. On 24 MHz the coil gave 1.6:1, and both the current baluns gave 1.9:1.

In this particular installation, no reduction in noise level was noticed.

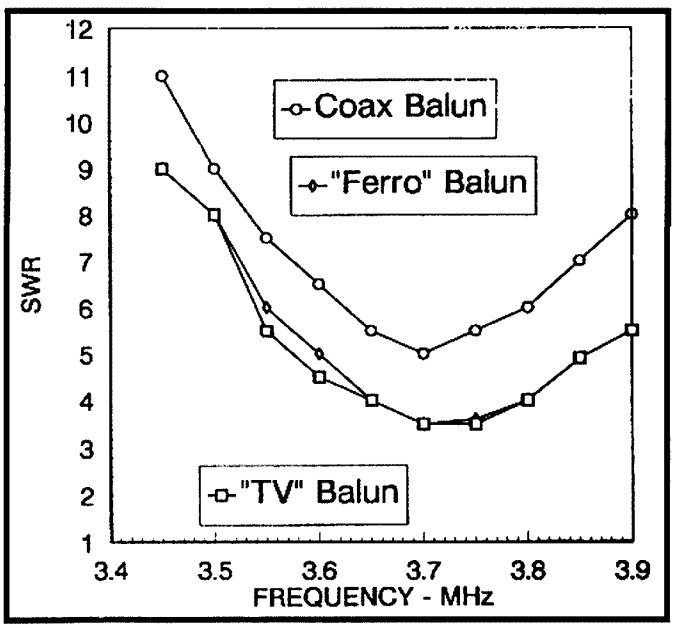
The Ferromagnetics balun is compact and well made. Installation is very easy. The support hook and two feeder terminals are made from stainless steel and the rest of the unit is sleeved in heat-shrink tubing to provide a waterproof assembly. An SO239 connector allows easy connection of the coax feeder.

It is an excellent unit and recommended for consideration for any G5RV or dipole installation.

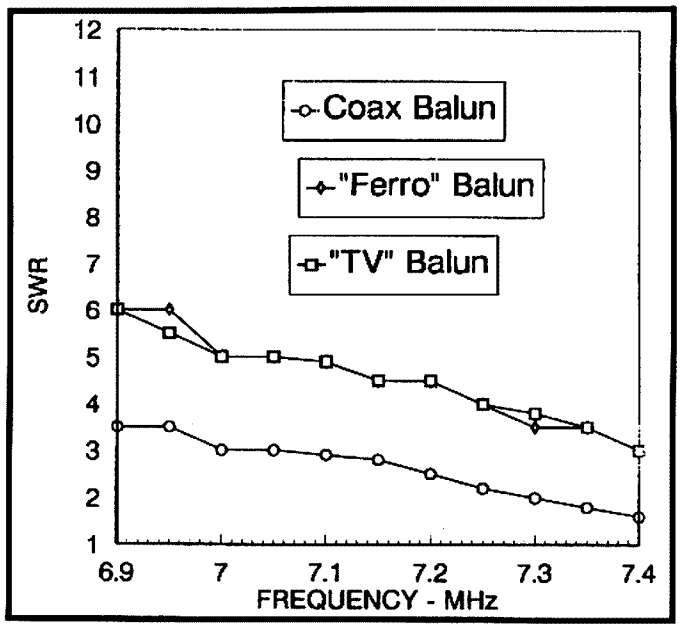
The manufacturer's specifications are as follows.

Frequency Coverage:	1.7 — 30 MHz
Input Impedance:	50 ohms
Input Connector:	Mil spec SO239
Series Z to the screen outer:	Better than 1500 ohms at maximum
Insertion Loss:	0.01 dB
Power Handling:	2 kW +
Weight:	8.5 oz, 240 grams

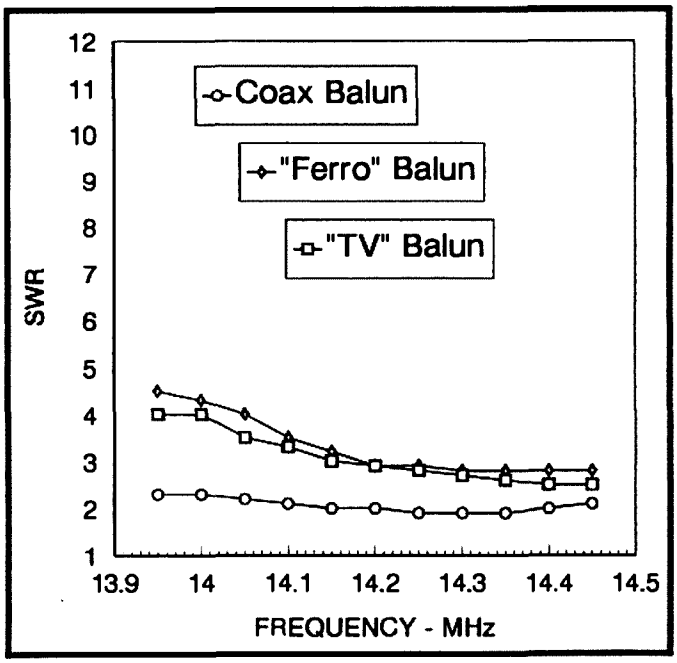
The sketch in Figure 1 shows the balun connected to and suspended from the matching section. You can do just that, or if the bottom end of the matching section comes within 5 or 6 feet of the ground, a post can be put into the ground at that point, and the balun can be fixed to that, so taking the weight off the matching section.



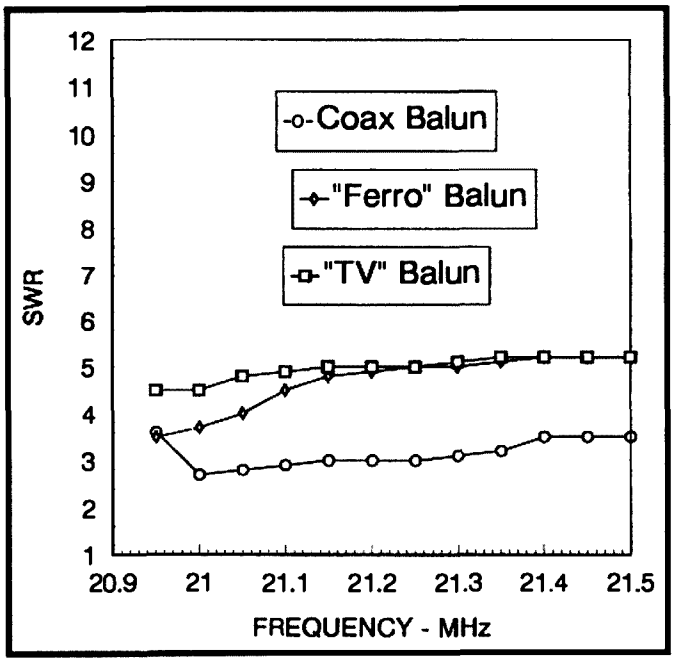
Graph 1 — SWR of G5RV on 80 m for 3 baluns.



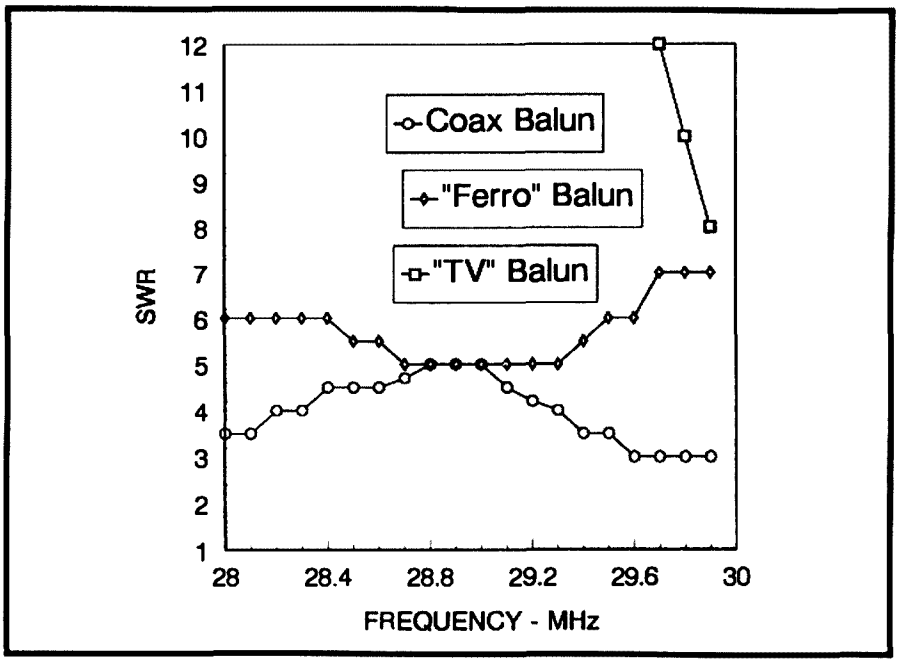
Graph 2 — SWR of G5RV on 40 m for 3 baluns.



Graph 3 — SWR of G5RV on 20 m for 3 baluns



Graph 4 — SWR of G5RV on 15 m for 3 baluns.



Graph 5 — SWR of G5RV on 10 m for 3 baluns.

Bill Orr Revisits the G5RV

In the 1992 November issue of CQ magazine, Bill Orr W6SAI revisits the G5RV. He describes how the antenna was devised by Reg Varney G5RV to operate on 20 m. It was fed with 34 feet of 450 ohm open wire line and 80 ohm coax. It functioned quite well on other bands when an ATU was employed at the transmitter. When adopted by the Americans, 300 ohm TV feeder was used as a substitute for the open wire line, an appropriate reduction of length being necessary to maintain an electrical half wave on 20 m, and 50 ohm coax line was used for the rest. When measurements were made with a VSWR meter the reasons for problems with loading on some bands became apparent.

Bill decided to check out the G5RV along with a current balun similar to that described earlier in this article. He installed a G5RV with the centre at 45 feet and the ends were held at 30 feet. The G5RV used by this Ron is 40 feet high at the centre and 15 feet high at the ends. His results are given in the following table.

As can be seen his results are similar to those achieved with the Ferromagnetics balun.

Bill noted that noise bridge and VSWR meter readings did not match until he fitted more ferrite beads over the coax at the shack end of the cable. He used 6 type 43 beads, Amidon #43-1024.

Presumably there was still some rf pick-up on the coax outer which would appear to be open circuited at the top. Perhaps the earthing was less than optimum.

His conclusions were:

1. A current type 1:1 balun should be used to connect the ribbon line to the 50 ohm coax.
2. Placement of the coax feedline with relation to the antenna is critical, and SWR will change with position.
3. If the G5RV is slung from a yardarm on a metal tower, the ribbon line should be spaced at least 3 feet clear of the tower.
4. A good match on any one band can be made by shortening or lengthening the ribbon line a few inches at a time. But this advantage is only achieved by a poorer match on some other band.
5. The SWR cannot be changed by changing coax length if the line is properly decoupled from the field of the antenna, but the impedance at the station end of the line can be altered by varying line length to provide the best match to the transmitter. If the SWR at the transmitter changes when the line length is changed, it is an indication that there is coupling between the outer shield of the line, and the antenna. Groups of ferrite

Band	Freq.	SWR	Band	Freq.	SWR
	3.5	6.3		28.0	4.83
	3.6	4.98		28.2	4.81
80 m	3.7	4.47		28.4	4.42
	3.8	4.66		28.6	3.99
	3.9	4.76	10 m	28.8	3.64
	4.0	5.67		29.0	3.34
	7.0	2.65		29.2	2.58
	7.1	3.05		29.4	2.29
40 m	7.2	3.67		29.6	1.94
	7.3	4.50		29.7	1.88
	14.00	1.83		WARC Bands	
	14.10	2.15	30	10.1	8.50
20 m	14.20	2.64	17	18.11	1.84
	14.35	3.28	12	24.95	4.52
	21.00	5.90			
	21.10	5.86		Representative	
15 m	21.20	5.71		G5RV Antenna	
	21.30	5.66			
	21.45	5.69			

Table 1 — Results of the G5RV checks on all bands (including 10 MHz).

Band	Freq.	SWR	Band	Freq.	SWR
	3.5	7.68		28.0	3.38
	3.6	6.26		28.2	3.49
80 m	3.7	5.25		28.4	2.92
	3.8	4.43		28.6	2.53
	3.9	4.36	10 m	28.8	2.11
	4.0	4.60		29.0	1.69
	7.0	1.72		29.2	1.48
	7.1	1.95		29.4	1.68
40 m	7.2	2.77		29.6	2.40
	7.3	3.00		29.7	2.55
	14.0	2.50		WARC Bands	
	14.1	2.20	30	10.1	8.11
20 m	14.2	1.76	17	18.11	1.11
	14.3	1.38	12	24.95	2.75
	14.35	1.42			
	21.00	4.96			
	21.10	4.94		Representative	
15 m	21.20	4.72		W6SAI Antenna	
	21.30	4.70			
	21.45	4.70			

Table 2 — SWR data for the 40, 20, and 10 metre bands for the W6SAI version of the ZS6BKW version of the G5RV.

slugs placed along the line intervals will help reduce this effect if it annoys you.

6. Tube type rigs with an adjustable output circuit have greater loading range than do solid-state transmitters. In many cases the tube-type rig can be used with the G5RV without requiring an auxiliary ATU.
7. It is a good idea to decouple the outside of the line at your transmitter. Do this by slipping six ferrite beads over the coax shield before you place the plug on the line. Type 43 beads (Amidon #43-1024 for RG-8 coax) will do the job. (Use Amidon #77-1024 for RG-58 coax).
8. Finally, the G5RV functions as an "all band" antenna (less the WARC bands), but an ATU is usually necessary unless a lot of time-consuming pruning and trimming of the ribbon is done. Even then, transmitter matching at the station will only improve one band at the expense of another.

Bottom line: The G5RV is a popular antenna and a lot of DX can be worked with it. It has a little gain over dipole on the higher bands, but not much. If you have a modern rig, be prepared to buy an ATU to make the antenna work properly (unless your rig has an ATU in it).

Incidentally, back in January 1989, Don VK1DK published an article in AR in which he calculated the VSWR of a G5RV antenna in free space. His results, reproduced below resemble those found by the practical tests reported here.

VSWR of G5RV as calculated by VK1DK

Frequency MHz	VK1DK VSWR
3.6	3.3 : 1
7.2	10 : 1
10.1	68 : 1
14.2	2.5 : 1
18.1	49 : 1
21.2	12 : 1
24.9	2.8 : 1
28.5	83 : 1

It should be noted that any calculation involves making certain assumptions which may not be fully achievable in practice. Also the measurement of VSWR involves using imperfect instruments in less than ideal testing conditions, giving rise to some uncertainty about the recorded values. So agreement to a few percent should not be expected, rather the trends, such as low VSWR on 14 and very high VSWR on 10 MHz are as much as can be expected. the effect of the environment can change measured results for the better as well as for the worse.

Yet Another Design for a G5RV

Someone is always trying to build a better "G5RV" and in the same article referred to earlier, Bill reports on a version from ZS6BKW. This is 10 feet shorter overall, 92 feet instead of 102 feet. Bill made up one as shown in Figure 2. The results are noticeably better but not a great improvement and an ATU would still be necessary on most bands.

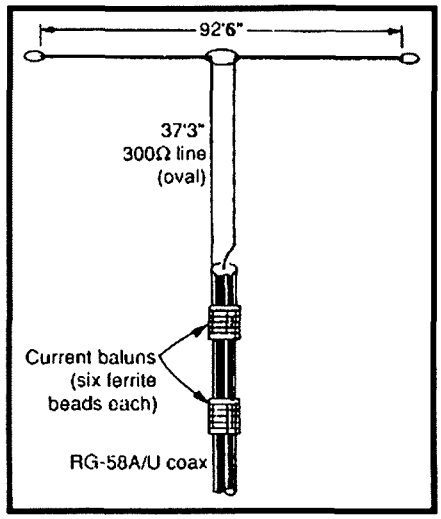


Figure 2 — The W6SAI version of the ZS6BKW version of the G5RV antenna! Normal details covering waterproofing of coax to ribbon connection apply.

Well that's it until next time, so its 73 from me and 73 from him.

The two Rons
ar

WIA News

WIA Policy Revamps

Continuing with publication of the 12 revamped Federal Policy items, commenced in last month's WIA News, this month we present the last three in the series.

EDUCATION

This Board CONSIDERING:

The requirement for technical and radio regulation examinations as a prerequisite to issue of an amateur licence;

The requirement for Morse code examinations for some grades of amateur licence;

The need to maintain an adequate level of entry standard to the amateur service;

The need to stimulate existing licensees to continue their training post licence level;

The need to attain and maintain a high standard of operating procedures;

The continuance of amateur radio relies heavily on adequate education of new members.

This Board RESOLVES that:

Negotiations continue with DOTC to ensure the statement of syllabus for each examination is regularly revised and maintained up to date;

The WIA establish an adequate training program for instructors;

The WIA prepare and make available to instructors adequate study guides and education packages for each grade of licence;

Divisions be exhorted to prepare and maintain training programs designed to assist intending licensees to:

Pass various grades of licence examinations in theory;

Create an awareness of the heritage and responsibilities of the amateur service;

Encourage amateurs to extend their knowledge past that required for a licence;

Assist new licensees to acquire good operating habits and an understanding of self regulatory procedures.

References: 82.092/1 Appx C5

Previous version: 82.092/1 Appx C5

Revised Jun 92 & Jul 92 Board meeting

Adopted: Oct 92 Board meeting.

CONCESSIONAL MEMBERSHIP

This Board NOTING:

Membership grades are determined by Divisions through their respective constitutions and include some or all of full, associate, country full, country associate, pensioner, family and student grades.

At an Extraordinary Convention in June 1989, Federal Council in considering the effort required to service each membership grade, RESOLVED (89.06.03/EC):

1. To recommend 2 grades of Federal membership subscription component, namely full grade and a concessional grade applicable to all members in all Divisions.
3. There will be a concessional rate available at a discount of 20% for the categories defined below.

A: Existing pensioner members:

B. Members in receipt of a full pensioner health benefits card:

C. Needy members, whose financial circumstances are not better than those persons eligible for a full pensioner benefit card, upon application to the relevant Division:

D. Student members:

E. Family members, for second or subsequent members residing at the same address. Family members do not receive AR.

4. That the discount be split proportionally between Executive and Divisional components, except that the discount applicable to members who do not receive AR, shall be borne by Executive.
8. For practical reasons, the actual sum payable may be rounded off.

[Resolution 89.06.03/EC items 2, 5, 6 & 7, which refer to actual subscription rates, implementation dates, automatic annual adjustments tied to CPI and recovery of shortfalls are now all superseded by later resolutions.]

At a meeting on 24 Oct 89, Federal Executive agreed a no Amateur Radio magazine membership grade would be offered. (891001)

Federal Office accepts and actions members' requests for reclassification to pensioner concession grade where satisfactory documentary evidence is provided and advises Divisions post the event.(90.10.02/EC)

Federal Council has defined a student eligible for concessional membership as a full time student under the age of 25. (90.10.02/EC)

Federal Office seeks re-confirmation of existing student membership status annually with the renewal notice. New applicants are required to establish their eligibility with their Division. (90.10.02/EC).

Requests for "needy" concessional membership are referred to the appropriate Division for a decision.(90.10.02/EC)

This Board RE-AFFIRMS:

Only two levels of Federal membership subscription component will apply, full and concessional.

Concessional membership will be at a discount of 20% split proportionately between Federal and the Division.

Applications with documentary evidence for change to concessional membership on pensioner grounds will be processed by the Federal Office and Divisions advised in their routine monthly returns.

New applications for concessional membership as a student will be processed after validation by the Division concerned. Renewal notices will be accompanied by a request for confirmation of student status.

A no Amateur Radio magazine subscription will be made available, by deducting the cost of the magazine component plus an administrative fee from the relevant subscription component.

References: 89.06.03/EC 891001 90.10.02/EC 91.02.03/EC.

Previous version: 82.092/1 Appendix C1

Revised: Sep 92 & Oct 92 Board meeting

Adopted: Oct 92 Board meeting.

PUBLIC RELATIONS

This Board NOTING:

The public image of amateur radio is poor;

There is no Federal co-ordination of efforts to improve this image;

Opportunities are being lost from this lack of co-ordination.

This Board RESOLVES that:

A public relations program be prepared by a co-ordinator, either professional or volunteer;

The program, including budgeting estimates, to be presented annually, to the Board for ratification;

The Divisions be encouraged to appoint their own Public Relations Officers who will be urged to exchange Information amongst themselves for maximal exploitation of opportunities as they present.

References:

Previous version: 82.106/1 Appendix D2

Revised: Sept 92 by VK4AOK

Adopted: Oct 92 Board meeting.

Technical Abstracts

Gil Sones VK3AUI looks at interesting technical ideas from other publications.

Doppler Direction Finding

We are all familiar with using a directional yagi or other unidirectional antenna to DF a hidden transmitter or interference source. The bearing obtained is not very accurate due to the relatively broad pattern. This may not matter in a conventional transmitter hunt.

There is however a system which uses switched aerials which is capable of much greater accuracy albeit with a possible 180 degree ambiguity.There is an advantage in that a simple FM receiver or a handheld can be used as the DF receiver. The ambiguity can be resolved by taking successive bearings from different positions on a baseline. A procedure used on HF with a DF loop.

The aerials are switched rapidly at an audio rate. This causes phase modulation of the signal at the audio rate due to the slightly different path lengths to each aerial. See Figure 1. This is detected easily on an FM receiver such as a handheld or scanner. The null will be very sharp.

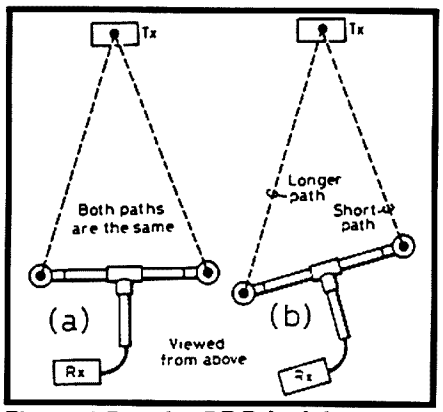


Figure 1 Doppler DF Principle.
(a) Equal path lengths give in phase signals.
(b) Unequal path lengths give different phase modulated by switching signal.

More complex systems can be built which use the audio signal to drive a directional indicator. However the ear is a pretty good detector and the brain is quite good at sorting out all sorts of variations in the signal. A manually rotated antenna together with an experienced operator is hard to beat.

The system is not new and was described in July 1981 in QST as the Double Ducky Direction Finder and the DoppleScAnt in May 1978 QST. These articles describe a manual system and a directional display system respectively. Simple systems using a pair of helical dipoles and using the operator's ears to detect the null have been described in *Radio ZS* Nov/Dec 1990 reprinted in *Rad Comm* April 1991 and a design from Scotland published in Technical Topics in *Rad Comm* July 1991. Both use helical dipoles as the two antenna elements. This gets over the problem of rotating a fairly large ground plane. The antenna array is smaller than the usual fox hunt beam.

The design data for suitable helical dipoles can be found in the RSGB Handbook Volume 2. The antenna should be dipped and adjusted onto frequency after being built from the tables. A most important step if the design is modified.

The *Radio ZS* design by John Williscroft ZS6EF is notable in the use of switched FET RF Amps to switch between the aerials. This avoids the use of PIN diodes which may be hard to obtain. It does however limit the aerial to reception so you have to avoid pressing the PTT. The circuit is shown in Figure 2. The FETs can be any VHF dual gate FET.

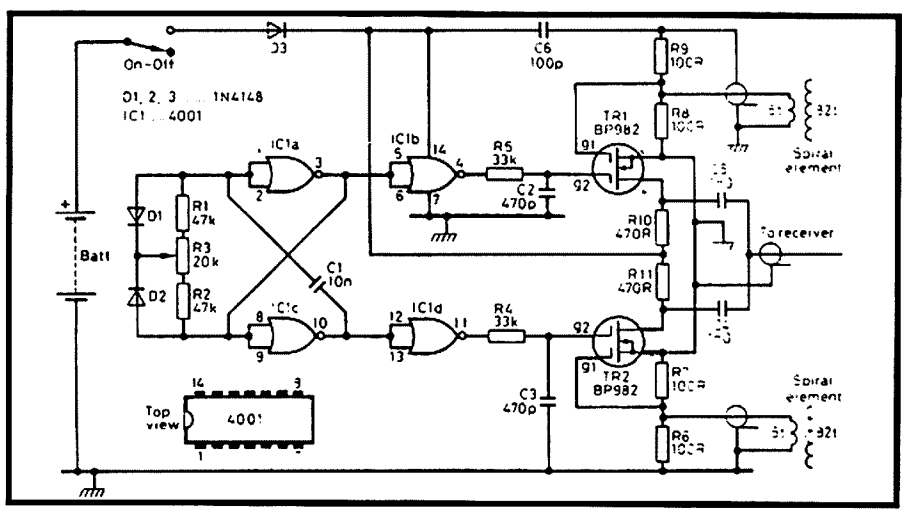


Figure 2 Electronic Switch and FET Preamps. Build into junction box at array centre.

The *Rad Comm* July 1991 design by Dave Plumridge G3KMG as shown in Technical Topics uses diode switching between the aerials. The aerials are however helical dipoles.

The antenna array is built from plastic conduit and wooden dowel. See Figure 3. The helical dipoles consist of 82 turns of 0.8 or 1.1 mm wire evenly spaced on a 450mm long 6mm wooden dowel former. The coupling to the feeder is by a 5 turn link at the centre of the helical dipole. The feeders from each aerial must be of equal length. The array is shown in Figure 2. The aerial element construction is shown in Figure 4. The aerials are dipped onto frequency by coupling a dipper to the exact centre of each helical dipole.

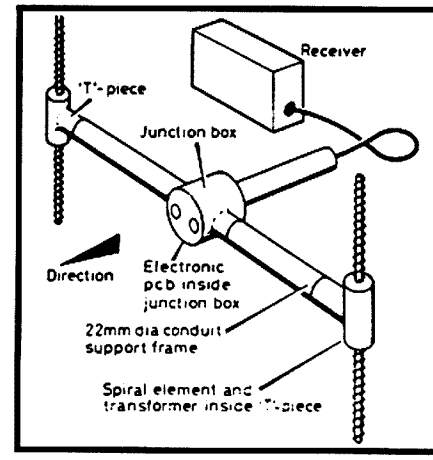


Figure 3 ZS6EF Doppler DF.

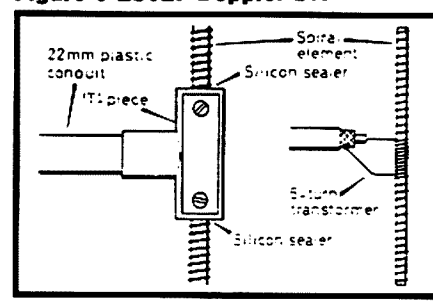


Figure 4 Spiral Element and Transformer.

With some experience accurate bearings can be obtained. Multipath signals will show up as odd audio effects. The null of the fundamental audio tone is very sharp. However by moving and averaging results it should be possible to resolve most problems that would have display systems dissolve into a shimmering mess of flickering LEDs.

The use of such systems may help those with repeater problems far more than inaccurate beam headings and guess-meter reports. ar

A Packet of Packet

Kevin Olds VK1OK *

Things have been a bit quiet for me personally on the Packet front lately, one of those situations where work and other hobbies have taken precedence. In conjunction with those who have been helping me by providing material for this column, we have been mapping out possibilities for future columns. Our greatest problem is in feed back from you the readers to help us know what you want to see.

In the last column I featured an item by Hugh Blemings VK1YYZ on Digital Signal Processing or DSP. This month Warren Toomey, VK1XWT describes an application of DSP to the amateur packet scene in the form of a radio modem, the DSP4 Project. Now over to Warren.

Introduction

The DSP4 project is the fourth DSP project designed by two Finnish amateurs, Kaj Wiik OH6EH and Jarkko Vuori OH2LNS. The project is a simple and flexible one which is ideally suited to the needs of amateurs.

Overview

The block diagram of the DSP4 project is shown in Figure 1.

The heart of DSP4 is the Motorola DSP56001 processor, which performs all of the signal processing. Internally, it has three functional units which work in parallel — the Data ALU, the Address ALU and the Program Controller. This parallelism gives the 56001 a great deal of processing power: a 24x24 bit multiplication, a 56-bit addition, rounding, two data moves and two address pointer updates can all be performed in one 74.1 ns instruction cycle. The 56001 also has many built-in I/O interfaces, allowing the DSP4 to be built with very few other components.

The 56001 is supported by 96kB of static RAM, half used for program storage, and the other half for data storage. A 256kB EPROM is used to store programs permanently (i.e. across power downs): the EPROM can either be a standard one or a FLASH EPROM; the latter allows you to alter the EPROM contents without pulling the chip out and "burning" the program in as is usually the case. You can also download new programs into the RAM at any time, but they will be lost when the power is lost.

The Analog/Digital and Digital/Analog conversion is done by the Crystal Semiconductor's CS4215 16-bit Stereo Codec. It has a top sampling rate of 48 kHz, giving the system a bandwidth of around 20 kHz and a S/N ratio of around 100dB — CD quality. The Codec also provides amplifiers for speaker, headphone and line output, and microphone and line-level inputs. Note that the DSP56001 does its processing on 24-bit values, which means no accuracy is lost with the Codec's 16-bit samples.

The DSP4 project provides two forms of digital I/O. The MAX232A and MCL2730 chips provide a standard RS-232 which is optocoupled to the processor, with a top data rate of 116 kbps in asynchronous mode, and up to 3.3 Mbps in synchronous mode. As well, eight general purpose TTL-level outputs and four TTL-level inputs are provided, which are diode protected for inductive loads on output and overvoltage conditions on input.

Lastly, two minor but important components of the DSP4 are the power supply and watchdog circuit. The power supply is a switched-mode one designed around the MAX738 chip, which provides all of the voltages required for the board from a 6 to 16 V DC supply. The total power requirements of the DSP4 is 3 Watts. The watchdog circuit is built around the MAX1232 watchdog chip, which must be "tickled" by the software every second or the chip resets the processor. This sounds great for those remote hilltop sites.

Software

The beauty of a DSP project is that the functions you can perform with it are only limited by the software you have available for it. Currently Kaj and Jarkko have software to transform the DSP4 into a 1200-baud packet radio TNC in KISS mode, and a 9600-baud G3RUH-type packet radio TNC in KISS mode.

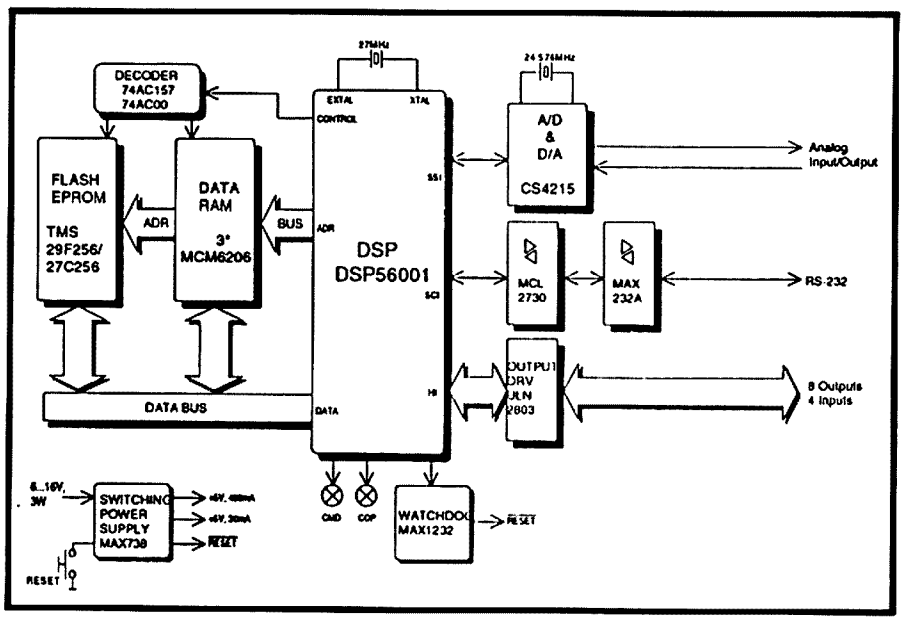


Figure 1 Block Diagram of the DSP4 Project.

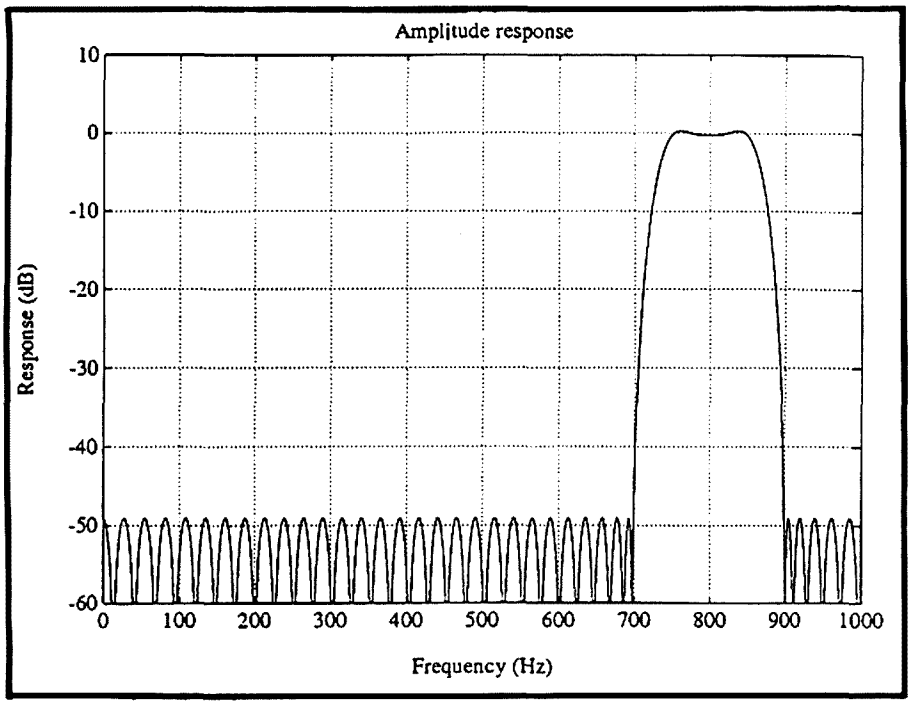


Figure 2 Frequency Response of CW Bandpass Filter.

Remember, because all of the signal processing is done in software, you can change from 1200 baud transmission to 9600 baud transmission in seconds, with not a single wiring change! Kaj and Jarkko plan to rewrite software from their previous DSP projects for the DSP4.

Although these are the only pieces of software currently available for the DSP4, I can think of a variety of applications for the project:

— Precision AF signal generator of any waveform you can think of.
— AF spectrum analyser.
— AF frequency counter.
— SSTV and FAX encoder/decoder.
— RTTY decoder/encoder at any data rates and frequency shifts.
— Third-octave (or better) programmable stereo graphic equaliser.
— Speech compressor.
— Special effects for those musicians in our ranks: chorus, flanger, echo, reverb, phaser etc.

The list is endless! As an example, Kaj and Jarkko describe a CW filter designed in software which is centred at 800 Hz and has a bandwidth of approximately 200 Hz. Software filters can be designed that could never be accomplished by analog ones: this CW filter is a 320-pole (yes, 320!) one with linear phase response over the pass bandwidth. The frequency response is shown in Figure 2.

All of the software written for the DSP4 project is freely available, as are the support tools (compiler, assembler, linker, simulator) from Motorola, and a wide range of software library routines such as Fast Fourier Transforms is also available from Motorola. The only problem is that you need to program deviously to get those three sections of the 56001 processor to all be occupied at the same time!

Hardware

The hardware of the DSP4 is fairly minimal and fits on a 160mm x 100mm four-layer card, with only twelve chips on it, plus about forty capacitors and resistors. The PCB has four layers because the designers found noise to be a problem on two layer boards.

Current State and Cost

At the time of writing, the schematics for the DSP4 project have been released by Kaj and Jarkko, but they are still fine tuning the PCB layout, although their prototypes are working quite well, from all accounts. As soon as they are happy with the PCB layout they will release the photoplots for them.

None of the chips on the DSP4 are cheap, and getting four-layer PCBs manufactured won't be cheap, either. At the moment I know of around two dozen amateurs in Australia who are interested in the project, and the more that become interested, the cheaper the chips and PCBs. A rough price estimate is that building the DSP4 will put you back $300 to $600. That might cause some grief to your back pocket until you realise you are getting at least two TNCs for that price, as well as any other programs that come along for the board — I'm very interested in getting a 4800-baud HAPN package written as well.

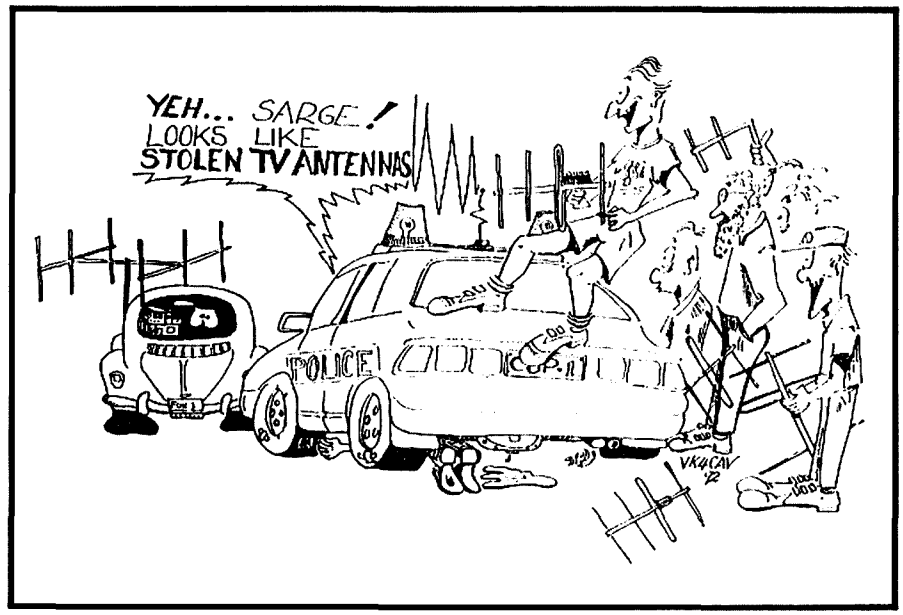
If you are interested in building the DSP4 project, please send me some mail at my OTHR. Once we have the PCB design and a firm number of financially interested people, we can begin to get firm quotes for chips and PCB production.

Conclusion

The DSP4 is an elegant and mostly affordable Digital Signal Processing project admirably suited for amateur radio applications. I'd like to thank Kaj Wiik OH6EH and Jarkko Vuori OH2LNS for all the hard work they have put in and for their happiness to make their designs freely available to the amateur community.

* *238 Southern Cross Drive, Latham ACT 2615*

ar



Repeater Link

*Will McGhie VK6UU **

A Saga

Repeaters can be interesting to maintain. Many repeater managers could tell a story or two, on the difficulty of being responsible for equipment that is many kilometres away on mountain tops, in difficult to get to locations. When a problem occurs with a remote repeater, even getting to the site can greatly add to the delay in repair. If the fault condition is intermittent, or will not show up while you are on site, added time is required to effect repairs. What follows is not unique, but may serve to emphasise the interesting nature of maintaining a repeater.

A recent fault with VK6RUF, our UHF voice repeater in Perth, proved to be an interesting one.

The symptom was, after a few minutes of operation the transmitter would stop transmitting. On closer investigation it was found that the transmitter was not altogether dead, just low power, about 1 mW. After a minute or so the transmitter would come on again for a short time, and then cycle between on and off; more off than on. The fault was traced to the exciter in the frequency multiplier stage, by checking the test points along the multiplier stages.

The fault was not mechanical, in that striking any part of the exciter or any other part of the transmitter, had no effect on the fault condition. The fault was temperature related. After a few minutes of operation the transmitter would go to low power. Circuit chiller applied to the multiplier stage would instantly bring the transmitter up to full power.

Hair Dryer to the Rescue (?)

To speed things up, a hair drier was used to heat up the multiplier stage, to bring on the fault condition after the circuit chiller was used. This is where it became interesting. The fault could not be bought on! No matter how hot the multiplier was made by the hair drier, the transmitter power remained steadfastly at full power. Repeated cooling by the circuit chiller, and heating by the hair drier could not bring on the fault.

Was there a fault anymore or not? Leaving the transmitter to cool down to room temperature, and then turning it on, confirmed that the fault had not gone away. After several minutes of operation the transmitter would go to low power. The component that bought the transmitter back to life when chilled, was a transistor in the exciter multiplier stage. The smallest drop of circuit chiller on this transistor and the fault would go away, but why would heating the transistor with the hair drier not bring the fault on again? Even more to the point, once heated by the hair drier, the fault would not show up when the hair drier was removed, and the transmitter left on for an hour or more.

Temperature Probe

A temperature probe was placed on the transistor and from room temperature the rise in temperature was observed from switch on. At 52 degrees Celsius the transmitter failed, and then the temperature of the transistor slowly dropped until at 46 degrees the transmitter turned on again. The transistor would then heat up again and so repeat the cycle, off at 52 and on at 46.

Short of an explanation it was time to replace the heat sensitive component. Once replaced the transmitter was turned on from cold, and with temperature probe in place, watched. At 52 degrees Celsius off went the transmitter and the whole lot went in the bin!

"After my little tantrum the transmitter was retrieved from the bin and placed back on the bench."

Tantrum didn't help!

After my little tantrum the transmitter was retrieved from the bin and placed back on the bench. If it was not the heat sensitive transistor, then what was the problem? Why would the hair drier not duplicate the problem?

I don't know when the idea began to form, but could the fault only be over a narrow range of temperature? This would explain why, when heated by the hair drier to a very hot temperature, the transmitter would remain on with no fault. Put another way, below a certain temperature the transmitter worked, and above a certain temperature the transmitter worked, but for a range of temperature it would not.

The temperature probe was placed on the transistor and the transmitter turned on. Once the magic 52 degrees was reached, off went the transmitter. Without letting the transistor start to cool (why it would cool down at this point was also unanswered) heat was applied slowly from the hair drier, and at 54 degrees the transmitter came on again! Removing the hair drier saw the temperature of the transistor continue to rise to about 60 degrees and stabilise. The transmitter remained on. Part of the mystery was solved, but why would heating the transistor with the hair drier from cold through 52 to 54 degrees, not bring on the fault?

The answer was the rate of temperature rise the hair drier could achieve. The transition through 52 to 54 degrees was so fast, that the transmitter would only switch off for a very short time, too short to notice. This was confirmed by applying heat from the hair drier slowly, at 52 degrees off went the transmitter. Heating the transistor quickly through 52 degrees produced no observable fault. A few answers but what was the fault?

With no idea what to do next I decided to go through the exciter and line up the multiplier stages. This was simple enough, as there are test points at each stage, and you just tune for a maximum voltage reading. With this done the transmitter was turned on from cold. No fault occurred at 52 degrees! No amount of temperature change would cause the fault to occur.

My conclusion as to what was happening is. The tuned circuit feeding the heat sensitive transistor was close to being off frequency. At the 52 degree point, the transistor reflected a small change in its input impedance to the tuned circuit, to further pull the tuned circuit off frequency. The base to emitter capacitive reactance changes slightly with temperature, and this change was enough to affect the tuned circuit, and maybe the operation of the previous multiplier stage.

Frequency multiplier stages are class C devices, and the transition between operating correctly and not can be very sudden. This shows up when tuning up a frequency multiplier strip. Very little change in tuning can result in no output from the transmitter, as other multiplier stages further on receive less drive and produce far less frequency multiplied out put. Class C operation requires a minimum drive level to work, particularly when frequency multiplying. It is a domino effect from full transmitter output to none. Anyway that is my theory. I had lost interest in any further investigation, as the repeater had been out of service for over a week.

Possible Answer

The explanation as to why the transistor cooled down after the fault had occurred, was due to lack of drive from the previous stage. If the temperature sensitive transistor was reflecting a load change back to the previous multiplier stage, to reduce its frequency multiplied output, then our heat sensitive transistor was then receiving insufficient drive to operate in class C, and it would stop drawing current and cool down. It's the only answer I have come up with.

If the fault occurs again, then all this supposition could be wrong, and the investigation starts all over.

This description is a condensed version, as there where three trips to the repeater site. The first one, to find that the fault would not occur on the bench at the repeater site, so the equipment was returned to operation, only to fail again. The second visit armed with circuit chiller and hair drier, only to be confused by the results, so the repeater was bought home. Much heating and cooling at home produced no fault, so the repeater was returned to the site, only to fail yet again. The third visit to bring it back to the work bench for a fix at all cost.

Time taken for repair 6 hours. Travel time 3 hours. Distance travelled 130 Kilometres.

There must be many a story better than this one, that needs to be told about looking after a repeater, particularly at a remote location. This repeater was only 15 Kilometres away with easy access. If you have a story to tell about your favourite fault with a repeater please send it to me.

** 21 Waterloo Cr Lesmurdie 6076, VK6UU @ VK6BBS*
ar

Have you advised DoTC of your new address

How's DX

*Stephen Pall VK2PS **

Being a good DXer means being a good listener. This widely accepted advice comes in very handy when one chases a rare DX station, like Ghana 9G1AA.

Before one starts calling the DX station, one should listen carefully long enough to establish the following facts: If the DX station is on the frequency, what callsign is it using and what is the QSL information? What is its "modus operandi"? Is it working transceive or split? If split, where is it listening? Up or down? Some listen down, especially on CW. Is the station calling in general terms or is it directing the call to specific areas, countries or continents? Is the station picking its contacts from the edge of the pile-up? If so, which edge? By following these simple rules the "novice" DXer will avoid acute embarrassment if he/she blunders on to the transmitting frequency. In addition to the above suggestions, please do not waste time and annoy everybody who is listening, by asking the DX station questions — as I heard recently — to confirm whether you are in the log for a QSO which you made 37 minutes ago?

Uganda could be on the air late April or early May.

Please forget giving your name and QTH, remember you are in a pile up! All you have to do is to give a report and identify yourself with your callsign and listen to the DX station for the acknowledgment of your report and your callsign. As a last advice; be courteous! Do not accuse your helpful fellow amateur who, 24 hours ago, gave you the vital information about a certain DX station appearing on a specific frequency, that he should move away, when the DX station was not on frequency, and your helper — whose name and callsign you have forgotten — is trying to organise a list for the orderly processing of the expected dogpile. Listening a little bit longer and establishing all the facts could prevent a very embarrassing situation for all of us.

GHANA — 9G1AA

Late in January several amateur members of the Dutch DAGOE Foundation were invited to operate from Ghana with the aim to raise funds for the provision of specialised medical facilities at Dormaa Hospital. Ghanian authorities informed the group that such an activity would foster good relations between Ghana and National Radio Societies. Since then, DXers all around the world waited with crossed fingers, wondering whether there would be any activity at all, from this West African nation where amateur radio was banned more than a decade ago. The first news about a possible activity came in September last year. It was hinted that the ban on amateur radio activities would be lifted when the Ghanian constitution reverted to civilian rule again, early in January 1993. After many false reports, on 26 March 9G1AA has appeared on the bands and tens of thousands of DXers wanted to work the station. The third of April was a lucky day for amateurs in our region, when the Ghanian station called to work only VK-ZL and Pacific area stations. QSL goes with donation to the humanitarian project, to PA2FAS: Wim Faasen, Weeskinderendijk 81,3314 CM Dordrecht, Netherlands.

MELLISH REEF — VK9M

Bill VK4CRR advises that in mid September this year, a group of operators — Bill VK4CRR, Harry VK2BJL, Steve P29DX, Murray WA4DAN, and Ken V73C — is planning to be active from Mellish Reef, a tiny speck of a coral reef, which lies due East of Cairns at lat 17 degrees 25' S and 155 degrees 51' E at a distance of about 600 nautical miles. The only permanent place on the reef is a small sandy coral cay, called Heralds Beacon. This is the only part of the sand reef that remains above water. The little islet is approximately 150 feet wide by 800 feet in length, almost devoid of any vegetation and rises to a height of about 5 feet. The only inhabitants of Mellish Reef are the many thousands of seabirds and several species of nocturnal crabs.

Several DXpeditions visited the reef in the past. Harry VK2BJL is a veteran of the 1982 expedition. October 1984 saw the "Down Under DXers Contest Club" (What happened to them? Anybody know?), Jan VK2CIA, Les VK2WU, Tony VK3CE and Rob VK5ARO operating during the CQ WW Phone Contest as VK9MR. In January 1989, Ian VE3IEO, Greg NM2L, Dave KJ9I, Yugi JR1RCQ, Bruce ZF2KN, Joe VE3CPU and Victor KD2HE operated for nine days, achieving over 31,000 QSOs on all bands as VK9ZM. To my knowledge, there was no activity from Mellish between January 1989 and the proposed activity in September 1993. The VK4CRR group plans to have 5 complete HF stations and one 6 metre station on the air, 24 hours a day, on all bands including WARC, operating SSB, CW and RTTY. They plan to stay for 10 days and are still looking for three more operators. The estimated budget of the expedition is $US 30,000 and donations are welcomed by Bill with cheques payable to the "1993 Mellish DXpedition" to the address: VK4CRR, Bill Horner, 26 Iron Street, Gympie Queensland 4570.

HOUTMAN ABROLHOS ISLANDS — VK6

At the time of writing this, it looks as if there will be some activity from these islands at the end of April or beginning of May. This limestone archipelago is about 400 km NNW of Perth, WA, and 60 km across the sea West from Geraldton, and it is the third most wanted island group (OC 71) in the world for those who are island chasers under the IOTA (Islands on the Air) award system. The islands are also known for the infamous "Batavia" mutiny in 1629 when 125 men, women and children were massacred

by the mutineers. The shelters built during this tragic episode still remain on the islands, which are now a wildlife reserve and landing is forbidden without prior Government permission.

Three West Australian amateurs, Bill VK6UE, Joe VK6BFI and Steve VK6VZ intend to operate from these islands for four days. They might use a special callsign and plan to be active on the 80 to 10 metre bands both on SSB and CW. QSL direct only via VK6ANC: North Corridor Radio Group, PO Box 244, North Beach WA 6061 with SAE, one "green stamp" or one IRC.

NAURU — C21

If everything goes according to plan, by the time you read this, the brief personal DXpedition of Atsu VK2BEX on Nauru Island will have finished. Atsu hoped to use the callsign C21/VK2BEX and be active on all bands in the CW, RTTY and SSB mode. The IC751, the Tokyo HI-power HL1K, the R7 vertical antenna and dipoles are the equipment which he took with him. Direct QSL address is: Atsu Asahina, PO Box 195, Killara NSW 2071 Australia, by the usual reply envelope and return postage method. Period of operation: 12 April to 22 April.

LIBYA — SA AND TUNISIA — 3V

Romeo 3W3RR has advised all the DX outlets that by the end of March or early in April he will be active from Libya 5A with a possible Tunisian 3V operation afterwards. He promises quick QSLing from his Bulgarian address: LZ/3W3RR: Romeo Stepanenko, Box 812, Sofia 1000, Bulgaria. He assures us that Box 812 is now under the direct supervision of the Sofia PTT office.

THE WANDERERS — HA5BUS

The Hungarian Bus expedition is slowly proceeding through the United States to its final destination: Hungary. After the shipping costs for the Australia-USA section were paid by a benevolent sponsor, the bus was allowed by the Customs to proceed with its crew from Los Angeles via Phoenix, Dallas and Tampa to Miami Florida. They left Miami on 16 April and arrived at the Dayton Convention on 22 April, where the bus was exhibited. From there they proceeded to Canada, visiting Toronto and Montreal. After two weeks in Canada, they will head South again via New York, Washington and will arrive at Jacksonville (FL), where the bus will be loaded on a ship departing for Bremenhaven, Germany on 5 June. The expected date of arrival in Budapest Hungary is 27 June.

FUTURE DX ACTIVITY

- XU7VK Sanyi was able to renew his licence, therefore he will be active until the end of June on 7-14-18-21-28 MHz bands SSB and CW. He is active mostly on weekends but can be heard sometimes during the week. QSL to HA0HW.
- Crozet Islands FT4WD appears regularly on the "14256" net around 1300 UTC. He was also heard on 14114 and 21152 around 1500 to 1600 UTC.
- Chris SP5EXA now has his own callsign in Qatar — A71CW. His direct QSL route is: Chris Dabrowski, Box 22101, Doha, Qatar.
- ZD9CQ is active on 14 MHz SSB from Gough Island in the South Atlantic. QSL to: PO Box 2934, Johannesburg 2000, Republic of South Africa.
- Marcel ON4QM expects to be active in May from Sao Tome & Principe.
- Spratly Islands. The much publicised DXpedition 9M0S did not take place in March. It is postponed to April or May this year. It appears that the proposed callsign might have caused some problems in certain quarters.
- Uganda could be on the air late April or early May, as the ban on amateur activity has been lifted by the Ugandan PTT. 5X1XA James Searcher, N3JCL, 855 Springdale Dr, Exton, PA 19341 will operate mainly SSB and 5X1XB Paul Rubinfeld, WF5T, Box 4909, Santa Fe, NM 87502 will concentrate on CW.
- Frosty K5LBU is now in Sierra Leone for the next 2 years. He requested the callsign 9L1CB.
- TN1AT can be heard on various DX nets between 1500 — 1900 UTC. QSL to F6FNU.
- There is a rumour that there will be a DX activity from Yemen at the beginning of October by a group of mainly Russian amateurs with some W, JY, and ZL participation.
- Attention IOTA island chasers. The Gove Amateur Radio Group VK8LC Mai, VK8CR Harry, VK8AZ Rick, VK8BD Bob and VK8TT Terry will be active from Truant Island from 22 to 24 May as VK8TI. Location: 136 degrees 50' E and 11 degrees 40' S Arafura Sea Coast, East Group. QSL direct to: PO Box VK8TI, Gove, NT 0881 or via the VK8 QSL Bureau.

INTERESTING QSOs AND QSL INFORMATION

- LY75BA — Gedas — 21 — SSB — 1037 — Feb. QSL to The Manager, PO Box 34, Birzai, 5280, Lithuania.

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

- VP2VF — Dirk — 28 — SSB — 0011 — March. QSL to The Manager, PO Box 137, Roadtown, Tortola, British Virgin Islands, Caribbean.
- 9M6BZ — Armstrong — 14236 — SSB — 1139 — Feb. QSL to Armstrong, PO Box 10375, 88804 Kota Kinabalu, Sabah, East Malaysia.
- S0RASD — Arseli — 7082 — SSB — 1801 — Feb. QSL to Arseli Echeguren, Bardeci, Las Vegas 69,01479 Luyando, Alava, Spain.
- TA3D — Yasar — 14009 — CW — 0625 — Mar. QSL to The Manager, Box 963, Izmir, Turkey.
- H44MS — Bernhard — 18152 — SSB — 0847 — March. QSL to DL2GAC, Bernhard Stefan, Aach Str 25, D-7772 Uhldingen-Muelhofen 1, Germany.
- FM5BT — Saint Yves — 14120 — SSB — 0749 — March. QSL to The Manager, PO Box 199, CP 97257, Fort-de-France, Martinique, Caribbean.
- V31DE — Derek — 21205 — SSB — 0524 — March. QSL to The Manager, PO Box 168, Belmopan, Belize, Central America.
- VK9LM — Rudi — 10100 — CW — 0818 — March. QSL to DJ5CQ, Rudi Muller Alter Main 23, D-8601 Ebing/Bamberg, Germany.
- N9NS/KH5K — Mike — 7015 — CW — 1207 — March. QSL to N9NS Michael C Goode, 10340 Broadway, Indianapolis, IN 46280, USA.
- 9A2WV — 14 — SsB — 0744 — March. QSL to The Manager, PO Box 312, Rijeka 51000 — Republic of Croatia.
- 4N5ET — Tod — 14006 — CW — 0609 — March. QSL to The Manager, PO Box 44, Kocani, Republic of Macedonia, via Bulgaria.
- C49C — 14253 — SSB — 0633 — March. QSL to The Manager, PO Box 4574, Nicosia, Republic of Cyprus.

FROM HERE AND THERE AND EVERYWHERE

- Murphy's Corner. The gremlins hiding in typewriters, word processors, and printers do cause problems from time to time. Not so long ago Dan FC1SVE wrote to us, pointing out that the date of the death of Napoleon was not in 1815 — when he was transported to Saint Helena — but in 1821, some six years later, when he finally passed away in exile (see page 43, Jan 93 AR). Thank you Daniel for the correction. It is good to see that "Amateur Radio" is read on many continents and in many countries. Closer to home, Les VK4DA points out that the QSL manager of VR6BB is not JH2KOZ (AR March 93) but JF2KOZ. Apologies all around.
- Ken Matchett VK3TL, the Honorary Curator of the WIA QSL Collection, advises me that it is now one of the largest collections in the world, made up of some 400,000 cards.
- Rolf DL6ZFG: Rolf Rahne, PO Box 15, D-3304 Gommern, Germany advises that he is QSL manager for the following stations from the CIS countries: 4K2CC — 4K2/UV3CC — UV3CC/UA1P — 4K2OKV — UF6FKW — UL7ACI — xx/UL7ACI — RL7AA — RA6WF — RE92C — UI1RWR — 4K4BG — 4K4BEM — 4K4BEU — 4L1FKW — ULOA — ULOACI — ULOOE — RM8MW and UM8MY.

- Neil VK6NE (VK9 — VK0 WIA Bureau Manager) wonders whether other QSL Bureaus are receiving or sending QSLs to the Peoples Republic of China QSL Bureau? He personally has never received any cards yet from "BY" land via the bureau. Neil also says in his letter to me, that he is yet to receive a complete list of the VK0 operators. Those listed in callbooks are hopelessly wrong. QSL bureaux feel the financial crisis everywhere. Neil says he received a 2 kg parcel from LU land for all VK call areas. If any VK is waiting on a QSL card from LU via the Bureau — and the cards go back to 1989 — their Bureau soon will have them.
- In the middle of March King Hussein of Jordan (JY1) appeared on the Butterly DX net, 14226.5 around 2230 UTC.
- The Mozambique Government has changed the callsign structure. New prefixes have been assigned from C91 to C96, the prefixes C97 to C90 are reserved for VHF and special event stations. C9RJJ is now C91J, and C9RDM is C91S. The QSL manager for both stations is W8GIO.
- DP0GVN is a German Antarctic station and can be worked easily from VK. QSL goes to DL1JCW Siggi Gredfel, Box 21, D-9250, Mittweida, Germany.
- Not all the Somali operations are acceptable for DXCC. According to Bill K5FUV, the operators need proof of the location, and a permission to operate from the person in charge of the area. The person in charge could be an UN or US commander or a local Somali official who might still carry on with the administrative duties despite the non existence of a national government.
- The Southern Cross DX net moved again, back to the old frequency on 14226 5 at 1100 UTC.
- The operations from Kingman Reef N9NS/KH5K started on 11 March and closed five days later. Palmyra N0FW/KH5 started up a day or so later after Kingman Reef but closed on 16 March due to personal injury to one of the participants and heavy rain damage to the equipment. The Kingman Reef activity produced 23500 QSOs, and the Palmyra activity in three-and-a-half days with only two operators netted about 10000 QSOs.
- Navassa Island in the Caribbean was a hive of activity for a short period between 26 March and 3 April. A large multi- national group of nine operators was active on all bands on CW, SSB, and RTTY. The callsign used was W5IJU/KP1. QSL goes to Vance Le Pierre, 2618 McGregor Blvd, Fernandina Beach, FL 32034 USA. It appears that when operating in the CW mode the callsign used was NF6S/KP1.
- The French administration has changed the prefixes of its overseas dependencies. The French overseas departments French Guiana (FY), Guadelope (FG), and Martinique (FM) will use the TO prefix. The French overseas territories FO, FP, FT, FR, FW, FK will use the TX prefix.
- Antoine Baldeck F6FNU who is or was QSL manager for many hundreds of DX stations, requires US$2 and an SAE for the return of the DX card.
- The 1993 HC8A operation can be confirmed by Betsy Townsend WV7Y, PO Box 644, Spokane WA 99210 USA.
- According to the DX News Sheet, Norwegian Telecom has issued an authority to Yuiri Zaruba UA0OBA to use the callsign 3Y/R0L on Bouvet Island during 1993. The Norwegian Dept of Environment has also issued a landing permission on Bouvet. The operation is proposed for April/May. However, the weather which is usually very bad at this time of the year in Antarctic waters, may prevent any activity.
- The special Canadian prefixes XK, XO, XN, are celebrating 300 years of postal communication.
- Gerard will be active from Angola as D2BG for a period ending 1 August 1993. Christian ex-TT8SA and ex-TR8SA arrived in Angola to begin a two year tour of duty. He could be active as D2SA or as D28SA. F6FNU is the QSL manager for both stations.
- Werner DK8KE who for many years conducted a net on the novice band around 21170 kHz, has become a silent key.
- In Tonga A35, the 18 MHz band can now be used by amateurs.

QSLs Received

Direct from managers or operators. HS0ZAD (4W op),V63OM (4W op), A35KB (4W op), 4S0UK (8W Mgr G8PDW), XU7VK (3W Mgr HA0HW), ZA1M (2M op via HB9BGN).

Thankyou

Thanks to all of you who have kept me informed and assisted me in compiling these notes, especially to VK2BEX, VK2DOJ, VK2GS, VK2KFU, VK2LEE, VK3TL, VK3CRR, VK4DA, VK4OH, VK4UA, VK5IE, VK6NE, VK6RO, VK6VZ, VK8LC, FC1SVE, HA5BUS, HA5HO, HA0HW, and the following publications, QRZ DX, The DX Bulletin, and the DX News Sheet.

Good DX and 73

* *PO Box 93, Dural NSW 2158*

ar

Education Notes

Brenda M Edmonds VK3KT *

I have recently taken a fresh look at the Regulations question bank, to identify questions which will become obsolete when the revised Regulations brochure is released. (Currently, it is expected that this will happen in July).

In the hope of being able to extend the bank, I went back to the sample examination papers which were prepared in the early 1980s. I was surprised at the number of questions which were no longer relevant, even to the current regulations. Questions are no longer asked about the local Authority which must give permission for a tower to be erected, or how to have a lost Certificate of Proficiency replaced, or EPIRBs or how to apply for a station licence. However, we do now have the possibility of questions on linked repeaters, operation of unattended stations and packet modes.

As the Amateur Service has become deregulated, less emphasis has been placed on the "Big Brother" side of DoTC, and it has become accepted that the amateurs, mostly, are prepared to live within a reasonable set of rules. Self-regulation has always been the aim. It is just that the framework was spelt out in more detail previously.

One problem arising from this latest deregulation will be the need for more examination questions, based on a reduced set of regulations, to be produced for the bank. If any readers have produced, or are able to produce, new questions, I would be very pleased to receive them for addition to the bank.

There have been a couple of suggestions to overcome the shortage of examinable regulations material. I would be pleased to receive comments from readers. Firstly, is a regulations examination really necessary now that so much deregulation has occurred? Secondly, why not put questions on operating practices (ie, traditional, not those laid down by DoTC) into the regulations examinations, or even add some sort of practical test? It is interesting to note that the new Novice licence issued in Britain requires attendance at a course of instruction, including completion of some practical activities, before a licence is issued.

Whilst on the topic of regulations, the continuing low pass rate for the regulations examination is surprising. It seems apparent that candidates are not giving sufficient attention to this section, or perhaps instructors are giving too little help. I know from experience that it is hard to teach the regulations, but the questions are nearly all straightforward memory tests, and there should be no excuse for a candidate not being prepared when attempting this examination.

Revision and extension of the Theory question banks is proceeding slowly. As usual, member input is welcome. In particular, any new questions on "Other modes" such as packet or digital modes would be appreciated. My thanks go to those who have already notified me of existing questions which need to be reworded or modified.

* *WIA Federal Education Co-ordinator PO Box 445, Blackburn, VIC, 3130.*

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

AMSAT Australia

Bill Magnusson VK3JT *

Satellite Frequencies

I was very pleased to receive a letter recently from Derek Mitchell VK7KKK high-lighting a wrongful inclusion in the OSCAR frequency list published in the March column. As was pointed out in the "current summary" in the January issue, UoSat OSCAR-14 has been removed from amateur radio service and is now being used by the SateLife organisation. I was sorry to hear of the error of course but pleased that, (a) some-one noticed it and (b) took the trouble to notify me. Thanks Derek. OSCAR-14 should not have been included in the list as it is no longer available for amateur use. All traffic previously carried by OSCAR-14 is now carried by OSCAR-22. OSCAR-14's future as an amateur radio satellite is unknown at this stage and as Derek pointed out it's wiser not to include it in the OSCAR list so as to prevent the possibility of amateurs fruitlessly trying to uplink to it or listen for its down-link signals. I did ask at the time for feedback and I repeat that request now. I intend to up-date that list and summary every six months or so. If any other readers notice an error, omission or anomaly please notify me ASAP, as there is a lead time involved in the preparation of material for the column, I'm already compiling the next list which should appear in a couple of months time.

Odd Spot

We're all familiar with ACRONYMs. Amateur radio examples like SAREX, AMSAT, OSCAR etc come to mind readily. No-one loves them more than NASA. Its own name is an acronym. This classic example was included in a recent bulletin outlining the various experiments on board one of the space shuttle missions.

HERCULES [Hand-held, Earth-oriented, Realtime, Co-operative, User-friendly, Location-targeting and Environmental System].

Even NASA recognises this as something of a record by going on to say, "This is the farthest we've seen anyone go for an acronym in the Space Program". And what is this device? IT'S A CAMERA! The description goes on; "This experiment takes a Nikon electronic camera, attaches gyroscopes, sensors, and a computer interface, and links it to a lap-top computer. When a photo is taken, it calculates the latitude and longitude of the site on the ground that was photographed, and records it on magnetic disk with the image".

MIR-STS QSO

The long awaited space to space QSO between MIR and the Space Shuttle has finally become a reality at just before 2325 UTC 10 APRIL 1993 off the coast of Chile.

At the time the two spacecraft were located approximately:

MIR Lat -51 deg. Lon -92 deg. Alt 394 km 1455 km W of Punta Arenas Chile.

STS56 Lat-54 deg. Lon -88 deg. Alt 290 km 1185 km W of Punta Arenas Chile.

With 100 kilometres of altitude between the spacecraft, no visual sighting was possible. But the ice has been broken, a QSO in space via amateur radio!

SOURCE: Amsat Australia net, Graham VK5AGR... 11 April 1993.

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

Amsat Australia net:
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z on Sunday evening depending on daylight saving and propagation . Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.

Amsat Australia newsletter and soft-ware service:

The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Aust. addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Manned Space Vehicle QSOs

One could not help being impressed by the current flurry of activity on the amateur bands from manned space vehicles and the promise of more to come. It may be timely to just go through some of the basics of working this kind of satellite "DX".

MIR

Voice QSOs are rare but be ready for them. Have the audio turned up when trying to work R2MIR-1 on packet. They have even been heard to call CQ. When working packet turn your retries down to 5 or so. If you don't get through after that you probably won't after 15. Listen for their packets before calling. Have the connect text already typed into your type-ahead buffer. Watch for a disconnect frame indicating a connect opportunity. Be ready to "hit the button'. They have DIGI turned on so even if you get a BUSY reply you can call another station using R2MIR as a digipeater in the sky. Keep your keps right up to date. Make sure your computer clock is accurate. If you have an inaccurate clock, a program like "CLOCKWORK" will help to keep it within a second or so. If you can't track, then use an "all-sky" antenna like a SLIM JIM or TURNSTILE. You don't need much power. I have worked them many times on a hand-held transceiver. Go for lower rather than higher passes. Even the best auto-track system will be hard pressed to keep up with MIR on an over-head pass. It just moves too quickly.

Shuttle

Unlike MIR, SAREX never uses simplex mode. There is always plenty of information on the packet network before and during a SAREX mission. (Sometimes ad nauseam). Make a note of the frequencies and stick to them. The packet robot is easy to work and usually results in a few seconds of QSO, a QSO number followed by a disconnect. Average of 5 to 6 seconds per contact. Once you've made it don't keep trying, let others have a go. I'm often asked how to get your feet wet on amateur radio satellites. Trying for MIR and STS contacts is the best bet for a new-comer to sample some success without much outlay for equipment. Just about every ham shack will have some VHF FM gear and an omni-directional antenna. The number of digital mode TNCs being sold would indicate that most shacks also have a computer these days. GOOD LUCK.

* *359 Williamstown Road, Yarraville VIC 3013*
Packet: VK3JT@VK3BBS
ar

WICEN

News from WICEN (NSW) Inc

The Annual Co-ordinators Conference is on the weekend of 15-16 May, at the Police Academy in Goulburn (same place as last year). All WICEN personnel (not just co-ordinators) are invited, for a fee of $55-00 per night; this covers all accommodation and food. Please contact Morton VK2DEX for further details. On the same weekend is a car rally in the central coast area, and Dave VK2UDT is looking for volunteers.

A Disaster Management Course is on the weekend of 22-23 May, and Barry VK2AAB is accepting applications from those personnel interested in attending. These courses are worthwhile as they give a good insight into what happens "behind the scenes" during disaster handling.

All WICEN personnel are reminded that the only postal contact with WICEN (NSW) Inc is PO Box 123, St Leonards 2065; all other addresses are null and void.

WICEN (NSW) conducts nets at various times; the most prominent are the Sydney VHF Net every Thursday night at 2130 (local) on repeater 7150 in Chatswood, and a state-wide HF net every Tuesday night on 3.615 MHz at 2030, although this net appears to be defunct.

Dave Horsfall VK2KFU
Publicity Officer
WICEN (NSW) Inc
ar

Divisional Notes

Forward Bias — News from the ACT Division

by Chris Davis VK1DO

Members in the ACT have participated in a survey of what and when members would like in terms of broadcasts, meeting topics, the role of publicising our hobby and, indeed, the value of the division maintaining our office which is located next to our regular meeting room at the Griffin Centre. Preliminary indications are that the office is considered of value. We are most likely to upgrade the role and importance of this central facility. An overwhelming number of members favour our weekly broadcast moving to a Monday evening instead of its present Sunday time slot. Within the survey we suggested that Monday would become a primary broadcast time with perhaps a local FM rebroadcast on the following Sunday. Many people took the trouble to endorse Monday as a more ideal primary time, but added that a later weekday evening would be preferable for repeats.

It is our aim in the ACT to devolve and share the role of broadcasts around the members of the division, and encourage each member to be active in the preparation, reading or engineering of our local broadcasts. Changes and enhancement to the control circuitry at Mt Ginini will facilitate a single input signal being radiated on both two metres and 70cm. This will greatly simplify the engineering difficulty of originating a divisional broadcast.

Incidentally, the Mt Ginini 2m voice repeater was struck by, or closely glanced by, lightning on Saturday 20 March, resulting in negligible transmitter power. Paul VK1BX and Rob VK1KRM attended our Monday 22 March committee meeting indicating their intention to travel to the site that night. The equipment on site was retrieved in total and returned to the comfort of a local operating theatre. The gear was restored to the site on Tuesday 6 April sounding better than ever. Our respect and great appreciation are extended to Paul and Rob for their professional efforts and promptness for what is a labour of love.

The technical topic for our May general meeting on 24 May will take the form of a presentation on feedline losses with actual demonstrations of the effects of losses in different cables and on different amateur frequencies. We look forward to seeing you at our May meeting.

73 de VK1DO

VK2 Notes

Tim Mills VK2ZTM

Country Field Days

The Oxley Region ARC will be holding its two-day event over the June long weekend at a new venue this year, the Wauchope Showground. In August, Wagga ARC will hold the second Riverina event in its region.

QSL Bureau Changes

Changes were recently introduced in the distribution of INWARDS cards from the VK2 Bureau. These have been detailed in VK2WI broadcasts, the annual report and in some club newsletters, as well as information included with card delivery. A free membership service posted to the address on file for the member. Non-WIA members can have the Bureau service for $36 per annum. The Bureau needs to know your wishes re handling, and you must keep the address and callsign details up to date. Outwards cards only via The Bureau, Box 73, Teralba; all other matters to QSL Manager, c/- PO Box 1066, Parramatta 2124.

New Members

The following joined the NSW Division recently, and our usual warm welcome is extended to them.

AS		Alford	VK2ASZ	Singleton
D	(David)	Barry	Assoc	Springwood
R	(Richard)	Benfatto	VK2CRB	Engadine
A	(Sandy)	Brucesmith	VK2AD	Pymble
DM	(Ron)	Cooke	VK2MMR	Round Corner
BR	(Barry)	Croker	VK2DBA	Crookwell
N	(Nigel)	Cupitt	VK2KJU	Seven Hills
HE	(Harry)	Dyer	VK2TBO	Woolgoolgan
G	(Gordon)	Faulkner	VK2TAC	Mayfield
LT	(Luke)	Gow	VK2GXQ	Taree
A	(Alaric)	Havyatt	VK2AZO	Woolwich
MJ	(Marjorie)	Jackson	VK2AMJ	Narrabeen
P	(Peter)	Jeremy	VK2PJ	Alexandria
BJ	(Bradley)	Latta	Assoc	Wollstonecraft
GA		McGilvray	Assoc	Coffs Harbour
AS	(Adrian)	Mueller	VK2MEC	Vaucluse
DJ	(David)	Nurse	Assoc	Auburn
S	(Sam)	Reisenfeld	VK2FPJ	Broadway
DAJ	(David)	Shaw	VK2TIP	Kogarah
JS	(John)	Telek	VK2XTB	Punchbowl
AW	(Allan)	Thompson	VK2GXL	West Ryde
PA	(Paul)	Thompson	VK2TPP	Narrabri
ML	(Michael)	Warner	Assoc	Guildford
RR	(Robert)	White	Assoc	Alfords Point
D	(Dennis)	Williams	VK2XDW	Mayfield

VK3 Notes

Barry Wilton VK3XV

Repeaters — VTAC Technical Note

If you are home brewing or modifying a commercial transceiver for use with a WIA Victoria licenced VHF *or* UHF FM voice repeater, the transmitter deviation should be adjusted to 4.7 kilohertz. Some amateurs have been setting deviation to 3.5 kHz as recommended in most commercial specifications. A deviation of 3.5 kHz will not provide an optimum result if the transmitter is used in conjunction with a repeater.

Sunday Broadcast

After a long period of dedicated service, Bill Trigg VK3JTW has relinquished the reins as Broadcast Co-ordinator owing to increased commitments to his employer. Bill will remain on the Victorian Division Council and continue to provide assistance when possible to his successor.

Thanks Bill for the dedicated service over a long period of time.

George Hunt VK3ZNE has been appointed to replace Bill.

Members are reminded that all advertisements of "items of equipment for sale" should be forwarded in writing to the Division office. Copy deadline is on the Tuesday preceding the broadcast.

News and other items of general interest are always most welcome.

New Membership Certificate

Design of a new membership certificate has been finalised. Printing will be completed this month, and new members who join the Victorian Division after May will be recipients.

Telephone RF Interference

Recent publicity regarding RF interference to Telecom's Touchfone 200 series telephones indicates there may be inconsistency in the manner in which the problem has been addressed by regional Telecom staff. There also appear to be differences in application of policy in different states.

WIA Victoria has been negotiating with Telecom at senior management level for many months, and has received both assistance and co-operation in rectifying interference problems experienced by members.

If you are having trouble with TF200 interference, it would be advisable to contact the Division office.

New Recruitment Brochure

Artwork and copy is now being finalised for the production of a much needed recruitment brochure containing information about WIA Victoria and its benefits and services.

Printing should be completed and the brochure available for distribution in June.

Book Sales

Members may have noticed an increase in the price of books published in AR Magazine every month.

The published price is now the "list price" and members of the Division will receive a 10% discount.

WIA Victoria carries most of the books advertised, however a few of the less popular ones are not in stock.

QSL Bureau

An audit of the QSL Bureau data base has recently been completed, and a number of callsigns deleted as the licensees are not currently financial members.

Cards for these persons will be retained for six months.

If you change or upgrade your callsign it is necessary to notify the bureau, in addition to the membership secretary or the Federal office. The bureau service is free of charge to members.

MEL03 CB Repeater

Several years ago the Victorian Division Council agreed to sponsor the licence for the Melbourne CB repeater MEL03 as a public relations gesture of goodwill.

This arrangement has now been terminated and the licence transferred to the Omega Radio Club.

5/8 Wave

Rowland Bruce VK5OU

I have just finished talking, (by telephone), to the President of the Division, Bob Allan VK5BJA. He was busy putting together his annual report to present to the AGM on 27th April. I don't want to pre-empt the full text which will appear next month in the Journal, and in any case, those who attended the meeting will know the contents already, but it sounded as

though he was having the same problem I encounter when I sit down to write this column. What is there to say that is important enough to live for posterity, and how does one avoid sounding like the Oscar presentations? "I would like to thank so-and-so, and thingummy-jig, and what's-his-name and....!" Gilbert's "little list" seems all too close for comfort. Nevertheless, there are always people to thank, sometimes unseen and unheard by the majority. Sometimes they get recognition, others sometimes may feel they do not. I can almost read your thoughts by now. "Get on with it then. Who are you going to thank this time?" I'm not!

Bob said a very telling thing. What he could put in his report was a heartfelt, "Well, we survived!" We have survived at a time when many things around us have not. Life has not been easy for many people in South Australia over the last year or so, yet again last month we went against the national trend towards recovery, and experienced another rise in unemployment. Nor has it been an easy time for the Institute. And now I am beginning to hear the same talk when I visit the Territory. Even the casino in Darwin has shed staff; Territorians are having to tighten the belt it seems.

In the midst of this we have survived. Amateur radio tends to be a fairly expensive hobby nowadays, at least to set up. The days of building a single band ten watt CW transmitter, and feeding a dipole or G5RV as the initial venture onto the bands has probably gone for good, yet once we are under way, the costs involved can be minimal. WHEN I get myself on air again, (yes I know, I've been threatening it for two years now,) then it will be with my 1976 TS520S, and a tower and antenna recycled from my previous address. Maybe in six or eleven years" time I'll do a final upgrade with some of my retirement package, but I'm sure, if necessary, I could manage to enjoy the hobby with my present equipment until all my earthly communication needs ceased. A bit of electricity and midnight oil to pay for, some QSL cards maybe, and, I hope, the ability to pay my membership of the WIA and I shall be happy. What an ideal hobby we have to be able to enjoy it in a situation such as retirement at so little cost. Old Amateurs ought never to die. There is always somebody to talk to a few kHz away! The other time the cheapness of the established hobby is useful is during periods of enforced idleness, following a spell in hospital, for example. And during nine months of being unable to find work, it was amateur radio which kept me sane during the day, and gave me something to do during the long nights of sleepless worry. (How else do you think I managed to put on such a spurt in the DXCC listings in 1980-81?)

So we are back to the beginning. Many amateurs are finding it tough. Some have had to relinquish their WIA membership. It may not be much at about $1.40 a week, but if it comes on top of other misfortune then the subscription may have to be the first thing to go. Through all this though, there are people to talk to, to reminisce with, to philosophise with, or just to bore. These are the people who ought to be thanked for their involvement in radio. What a marvellous hobby we have indeed.

ar

VHF/UHF An Expanding World

Eric Jamieson VK5LP *

Six metres

Last month I reported **Andrew VK8AH** had worked XU5DX and XU0UN in Cambodia on 25/2. However, it appears **Steve VK6PA** worked XU5DX on 1/1/93 so that would have to be a first for VK. Also, XU5DX was worked by P29CW, and by **Ron VK4BRG** and **John VK4TL** on 5/3 at 0621 on CW, which no doubt pleased both operators. I also understand the Cambodian stations were worked by **VK8RH** and **VK8ZMA**, so the signals were shared around northern Australia.

Pitcairn Island

John VK4TL also advises that on 13/3 at 0615 he worked VR6JJ on Pitcairn Island which appears to be a first from VK on six metres. I had received a report some days earlier that John and Ron had heard what they thought was VR6JJ but the signal was too weak to correctly identify. Has anyone else worked VR6JJ? QSL route for VR6JJ and VR6BB is JF2KOZ.

So once again the equinox has provided some rare signals and this indicates that six metres is not dead — hence the age-old adage that *six metres never really closes down, it's only the operators who do!*

Seems strange to read about so much QRM via the moon.

Published in the Japanese *CQ Ham Radio* magazine for March 1993 (copy by courtesy Graham VK6RO) is a picture of the late **Bob VK4NG** sitting in his Rockhampton shack in 1956 about the time JA1AHS established the first JA overseas QSO when he worked Bob. I immediately noted the two AR7 receivers amongst the other equipment, one complete in its rack and the other sitting on the bench with the large coil boxes placed on top. With this observation I went into "nostalgia mode" as at one time I owned three of these receivers and to this day regret that I did not keep one! It appears the contact was made on 50.700 MHz which is well up the band but there were probably good reasons for the choice of frequency, but we may never know as Bob is now a Silent Key.

From the same source I note that JA9TLD worked 9M6HF in Eastern Malaysia on 1/1/93 at 1035 on CW and 1050 on SSB, and at 1635 worked XU5DX in Cambodia. XO0UN was worked on 11/1/93 by JA2VFH and others and the Pitcairn Island station VR6JJ was noted on 50.120 at 1130 on 29/1/93. QSL route for XU5DX is F6FNU and XU0UN is VK3OT.

News from Europe

Geoff GJ4ICD reports that Andorra will come on 50 MHz with C31HK indicating interest but has no equipment. It took five years of negotiations with the PTT to receive a six metre permit, the difficulty being exacerbated by previous amateurs operating outside their licence conditions. As a result, only residents can operate on the VHF/UHF bands and no more expeditions will be permitted.

Ted Collins G4UPS reports those awaiting a QSL from 7Q7JA should not despair as he has just received his card for an October 1990 contact. QSL route is via his home callsign JL1IHE — Yoshitaka "John" Kawaku, 2-10 Yamate, Saitama 357, Japan. Also QSLs for Bob 9K2ZR can only be received via Andy K8EFS.

UK six metre contacts during February seem to be limited to D,F,LA,OE, OH,OZ,S55,SM,SP,9A2 and 9H. You notice I said "limited to" but their tally is at least eleven countries! Also mention was made of the contact between DK5UG and VK4FP on 21/2 at 0840.

Ted also sends a list of the 150 countries/prefixes worked by **UK amateurs** to 17 January 1993. As I will be soon running a similar list for VK, you may eventually like to compare the differences. To save space they are not in column form but are listed alphabetically to assist you. They are: 1A0, 3DA, 3X, 4J1, 4U1, 4X, 5B4, 5H, 5N, 5V, 6W, 6Y5, 7P8, 7Q, 7X, 8P6, 8R1, 9A, 9H, 9J2, 9K2, 9L, 9Q, 9X, 9Y, A2, CE, CN, CO, CT, CT3, CU, CX, C3, C5, C6, DL, DU, D4, D6, EA, EA6, EA8, EA9, EI, EL, ES, F, FM, FP, FR5, FR7, FY, G, GD, GI, GJ, GM, GU, GW, HB9, HB0, HC, HC8, HH, HI, HK, HP, HR, HV, HZ, I, IS, JA, J37, J5, KG4, KG6, KP2, KP4, LA, LU, LX, LY, LZ, OA, OD, OE, OH, OH0, OH0M, OK, OK1/2, OM, ON, OX, OY, OZ, PA, PJ7, PJ9, PY, PY0, PZ, P4, SM, SP, SV, S0, S5, TA, TF, TI, TK, TL, TR, TU, T7, UX1, UL7, UZ2, VE, VK, VP2E, VP2M, VP2V, VP5, VP9, VS6, V2, V3, V4, V5, W, XX9, YL, YN, YO, YU, YV, YV0, ZA, ZB, ZC4, ZD8, ZF, ZP, ZS, ZS9, Z2. From the above you can see the UK fared rather well. The main ones missing are those from the Pacific area which are available to us, e.g. 3D2, 5W1, A35, FK, FO, H44, KC6, the full KH and T3 series, V85, VK9, YJ, ZK and others. Interesting omissions are KH6, P29, XE and ZL.

50 MHz DXCC Honour Roll

The following is the latest tally of operators callsigns who have worked 100 (DXCC) countries or more on six metres. There are 106 callsigns representing four continents, the absentees being Australia and Africa, both of whom may have to await the next cycle, but then, with the unpredictability of six metres, you never know! However, for everyone, the upwards climb will now be very slow. Many stations are waiting in the 80s and 90s including VKs. Some overseas stations need to brush-up on their QSLing, one in particular I note has worked 99 countries and confirmed 65!

152 JA4MBM
130 PY5CC
125 VE1YX
124 G3WOS
123 JA1RJU
120 JA6RJK
119 W2CAP/1, W5FF, WA1OUB
118 K5FF, PA0ERA
117 K5CM
116 JA1BK, W4CKD/8
115 K1TOL, K8WKZ
114 N5KW
113 JA1GTF, JE1BMJ
112 G0JHC, JA1VOK
110 JA3EGE, W3XO/5
109 K2QIE, W2IDZ, W3WFM
108 CX8BE, G4JCC, WB2WSV, W3JO, WW8M
106 JR6WPT, PA2VST, W5VY
105 G4UPS, HC1BI, OH2BC, WA6BYA
104 9H1CG, G3JVL, G3ZYY, GI0OTC
103 G4AHN, JA1PVI, JA6TEW, K1GPJ, KH6IAA, NI6E/KH6, PA0HIP, W4OO
102 GJ4ICD, JF2KOZ, JR6WXY, K3QMX, K4CKS, LU3EX, W3IWU, WZ8D
101 G4CCZ, JA9SSB, JI1DLZ, JI2CCF, JR2AJS, JR2AUE, JR3HED, JR6HI, KP2A, PA3BFM, SV1DH, W1JR, WB2MAI
100 G3JVL, G3RFS, G3ZYY, G4IGO, JA1BK, JA1GTF, JA2BZY, JA2DDN, JA6RJK, JE2IIH, JE2KCP, JE2KDN, JH2HCB, JH2NZM, JH2TQH, JH2TQM, JI2CCF, JJ3WXG, JK1PEC, JR2HCB, JR2HOG, JR3DVL, K1JRW, K2MUB, K6QXY, K8EFS, KA1PE, LU3DCA, LU8MBL, PA0VST, W5EU, WA2BPE, WB2CZB, WB4OSN, WB8VYF

Acknowledgements to *QST* December 1992, JA1VOK, January 1993 *Five Nine, CQ, Ham Radio* and *VK3OT*.

Microwave news

Wal VK6KZ has sent me details of an inaugural 10 GHz record claim for Western Australia. This took place on 28/2/1993 at 0128 over a distance of 85 km, with reports 5x6/7 for a contact of 30 minutes.

Ross VK6KAT accompanied by **Bob VK6KRC** was the other end of the contact, and they operated from the roadside between Roelands and Collie at a height of approximately 220 metres AHD. VK6KZ operated portable near Cape Naturaliste Lighthouse at a height of approximately 120 metres AHD.

Both stations used similar equipment, namely ex-military Tellurometers Model MRA301 using an Eimac klystron Type EM1070 providing 30 milliwatts and tunable between 10.050 and 10.450 GHz. The antenna was a 317 mm diameter parabolic dish with stated gain of 27 dB above an isotropic radiator. Modulation was FM phone.

With such high gain antennas, pointing accuracy was critical. Ross examined the site in daylight and then in darkness took a bearing on the flashes from the lighthouse. Wal initially used a compass bearing which when combined with the accuracy of Ross's signal allowed the two dishes to be correctly aligned.

The above contact follows other contacts over 50 km by stations such as VK6ZSB/p and VK6XH/p; by VK6KZ/p and VK6KRC/p and a 71 km contact between VK6KRC/p and VK6ZFY/p in the December/January period. Good work!

While talking about 10 GHz, VK5KK, VK5NY and others are almost ready to commence serious work using narrow-band techniques and will be seeking to establish contact over several hundred kilometres, so watch out Wal!

On the subject of 10 GHz, I note in the 1/1993 issue of *Dubus* magazine (courtesy Doug VK3UM) that European amateurs exhibit a keen interest in that band, with 31 entries in their top listing, the greatest distance of 1043 km attributed to SM6ESG and the shortest 300 km to DB4CEP/p. Nineteen of the claims are for distances in excess of 500 km, with ten in excess of 800 km. VK5 will need to bridge that magic gap of 1800+ km between Adelaide and Albany to really put a dent in the European effort.

From *The World Above 50 MHz* by Emil W3EP, the North American distance record for 10 GHz is a tropo contact over a distance of 957 km on 10/9/88 between NN6W and N6XQ. The 24 GHz record was extended to 256 km on 12/9/92 by KK6TG/6 and WB7ABP/6, using 10 mW CW rigs and 60 cm dish antennas. Liaison was on 144 MHz.

On 47 GHz the present American record of 105 km of 6/8/88 by K7AUO/7 and WA3RMX/7 has been broken by a 166 km contact on 15/9/92 between HB9MIN and HB9MIO. According to Emil W3EP, the Swiss pair used similar home-brew transverters with 144 MHz IFs and transmit what they call constant amplitude single-sideband modulation (CASM). These signals can be amplified with minimal distortion by Class C amplifiers, yet are compatible with SSB receivers. Transmit power was 8 mW with 60 cm dishes providing 45 dB gain; receiver noise figures were about 10 dB. Signal reports were S2-3 each way and antenna sighting was done using 24 GHz gear running less than 1 mW of power!

EME Report

This is a difficult segment to keep alive as so little information comes to hand. However, **Geoff GJ4ICD** reports **Charlie G3WDG** has completed two QSOs via the moon on 10 GHz, the initial QSO with WA7CJO and the second with SM4DHN. It would be interesting to hear more about those contacts.

Doug **VK3UM** sends news of his 1993 EME activities using 432 MHz. 9/1: 1910 UTC UT5DL, 1917 EA2LU, 1925 G4RGK, 1928 HB9SV, 1936 JA6CZD, 1953 OK1KIR. 10/1: 1200 W2PGC on CW and SSB, 1248 N2IQU.

6/2: 1100 W2CRS, 1141 9M2BV, 1730 UA4API, 1118 DF3RU, 1816 DL3BWW, 1832 SM2CEW, 1845 IK1MTZ — so many calling that Doug lost the moon in the process! 7/2: 1816 RA3YCR, 1828 DL3BWW, 1844 UT5DL, 1851 RB5EC, 1858 I5TDJ, 1905 DL9NDD, 1908 RB5PA, 1920 RB5LGX, 1923 OH2PO, 1954 ON2OF, 2002 I5CTE, SP5CJT, then a mass of signals, the QRM causing him to lose the moon, again! Seems strange to read about so much QRM via the moon, this tends to indicate there must be many stations now capable of being heard by the better equipped stations — I suppose this is the penalty one pays for continuing system improvement, including much better receiving capability.

5/3: 1600 EA3UM. 6/3: 1930 W8TN. Current initials 178, countries 34.

Closure

So far the equinox has been lean on DX stations and lean on news, but now April has arrived results may improve. I look forward to receiving some news from those who operated in the John Moyle Field Day on 20/21 March.

Closing with two thoughts for the month: 1. If there's one thing that makes a husband angrier than his wife refusing to tell him where the money went, it's her telling him, and 2. Everyone eventually stops smoking. Mother Nature — the most permissive of parents — sees to that. Those who smoke heaviest stop earliest.

73 from The Voice by the Lake

** PO Box 169 Meningie SA 5264 All times are UTC*

ar

QSLS
WIA QSL Collection

Readers are advised that the WIA QSL Collection may be inspected at most times during the week. A telephone call will be necessary in order to make the appointment.

A part of the collection may be borrowed by radio clubs for the purpose of display. Also, photostat copies of QSLs may be made available to radio historians who are considering writing an article on radio operation.

Most of the QSLs of the more active radio operators, both pre-war and post-war, are in the collection. Through liaison with other societies trying to save something for the future, an exchange system with other countries has been established.

If you, as a reader of the series of articles entitled "QSLs from the QIA QSL Collection", are interested in contributing a few of your own QSLs, please contact the honorary curator of the collection: Ken Matchett VK3TL, 4 Sunrise Hill Rd, Montrose. Ph: (03) 728 5350.

ar

CONTESTS

*Peter Nesbit VK3APN **

Contest Calendar May-July 93

May 1/2	ARI (Italy) CW/SSB/RTTY	(Apr 93)
May 8/9	CQ-M (Russia)	(Apr 93)
May 29/30	CQ WPX CW	(Mar 93)
Jun 5/6	RSGB Field Day CW	
Jun 12/13	ANARTS WW DX RTTY	
Jun 12	VK/ZL/P29 80m Sprint	
Jun 19/20	WIA Novice Contest	
Jun 26/27	ARRL Field Day	
Jul 1	Canada Day CW/phone	
Jul 3/4	Venezuela SSB DX	
Jul 10/11	IARU HF Championship	
Jul 24/25	Venezuela CW DX	

In the "General Rules" published last month, the suggestion to mark contacts as "solicited" if they fit certain criteria may have puzzled a few readers. The suggestion actually originated from a contest manager in the USA, following a 160m contest in which the log of a particular W contained a number of Caribbean callsigns which did not appear in anyone else's log, and significantly improved his multiplier. The manager's initial reaction was to disallow the contacts (as can happen, rightly or wrongly), however upon contacting the stations concerned he discovered that they resulted from skeds made by the W, and were therefore perfectly valid. In his summary of the contest he said that prior planning such as this could only help the contest, however for their own protection, stations making skeds ought to bring that fact to the attention of the contest manager. Bear in mind that the suggestion is by no means mandatory, and that contacts marked as "solicited", "sked" or whatever will usually be more closely scrutinised.

If you receive an award in one of the smaller DX contests, there is a good chance that a copy of the results and rules for the next contest will be included. If so, it would be appreciated if you would send this information (or a copy) to me for inclusion in this column. As some of the smaller contests are poorly publicised, and the results hard to obtain, here is a good opportunity to help with publicity.

Until next month, good contesting!

73

Peter VK3APN

Contest Details

The "General Rules & Definitions" published in April AR apply to the following contests, except as otherwise indicated.

RSGB Field Day

June 5/6, 1500z Saturday to 1500z Sunday.

This CW contest usually stimulates considerable portable activity in the UK and Europe. Overseas stations are invited to participate and submit a log, but otherwise are ineligible to compete. Certificates will be awarded to the overseas stations in each continent making the most contacts. Send log to: RSGB HF Contest Committee, PO Box 73, Lichfield, Staffs, WS13 6UJ, England.

ANARTS WW DX RTTY

June 12/13, 0000z Saturday to 2400z Sunday.

This contest is organised by the Australian National Amateur Radio Teleprinter Society, and runs on the second full weekend of June each year. The object is to contact as many stations locally and overseas as possible on 80-10m (no WARC bands), using any digital mode (no satellite). Categories are single & multi operator (one TX only), and SWL. Max operating time is 30 hrs single op, 48 hrs multiop. Messages comprise RST, TIME, ZONE. Contacts are scored according to zone worked, and the following tables show the points for each zone worked, in order from 1 to 40 (left to right, top to bottom):

Your Zone = 28:

31	40	40	44	45	49	53	51	55	54
49	48	46	32	30	26	22	20	20	25
20	11	14	10	15	05	07	02	10	17
31	24	34	25	36	30	22	26	19	34

Your Zone = 29:

39	50	43	52	54	47	49	54	52	44
42	37	37	42	39	36	32	30	30	34
28	21	24	20	23	16	15	10	02	09
15	32	42	33	39	31	24	24	20	44

Your Zone = 30:

35	50	35	44	46	38	40	44	45	37
41	33	34	49	47	42	38	45	32	43
37	29	30	24	30	22	18	17	09	02
24	07	51	42	47	40	33	32	29	48

Here is an opportunity to enter a fun event, whilst being competitive . . .

Countries per ARRL DXCC list, except that mainland VK, VE, JA and W are not counted as countries, and instead each call area in mainland VK, VE, JA and W counts as a separate country. Call areas outside these mainland areas (e.g. VK0, JD1, KL7, KC4) do count as separate countries. One's own country does not count as a multiplier (ie VK call area).

Points are determined for each band and then added. Countries are similarly tallied. Continents are those worked on all bands (max 6). Total score is: points x countries x continents. Send log to: Contest Manager, ANARTS, PO Box 860, Crows Nest, NSW 2065, by 1st September. Original rules and a full page scoring table are also available from ANARTS upon receipt of a SASE.

VK/ZL/P29 80m Sprint

June 12, Saturday 1230-1330z.

This inaugural event is organised by the Redcliffe Radio Club of Queensland, and honours the late Merv Stinson who helped many amateurs in various ways through the auspices of the club. As a sprint, the object is to contact as many stations on SSB as possible, in a 1 hour period. Frequencies are between 3.535 and 3.7 MHz. Both single and multi operator entries are welcome, also SWL. Exchange RS + serial number (leading zeros are optional, i.e. 591 can be used instead of 59001). The score is the number of stations worked (no multipliers). Send log to: Contest Manager, Redcliffe Radio Club, PO Box 20, Woody Point, QLD 4019, by COB 19 July. Certificates to the highest scores (1) overall, (2) in each VK call area, (3) in ZL, (4) in P29, and (5) rest of world.

Here is an opportunity to enter a fun event, whilst being competitive with other stations, and at the cost of only one hour on a Saturday evening! Other sprints are also planned.

ARRL Field Day

June 26/27, 1800z Saturday to 2100z Sunday.

This mixed mode contest is open to W/VE. As with the RSGB Field Day (see above), overseas stations are invited to participate and submit a log, but otherwise are ineligible to compete. Exchange RS(T) + QTH, W/VE will send operating class + ARRL/CRRL section. Send log postmarked by 27 July to: ARRL Field Day Contest, 225 Main St, Newington, CT 06111, USA.

Results of 1992 RSGB 21/28 MHz SSB Contest

ZL1AAS won the Oceania section with 2754 points, and VK9CC was second with 174 points. Alan Winter (VK6) was 5th outright in the SWL section with 2633 points. There were no other VK entrants.

1993 WIA VK Novice Contest

19/20 June 1993, 0800z Saturday to 0800z Sunday.

The object of this contest is to encourage amateur operation in Australia, New Zealand and Papua New Guinea, and particularly to promote contacts with novice and radio club stations. Only stations in VK, ZL and P2 call areas are eligible to participate.

All operations must be confined to the novice frequency allocations in the 10, 15 and 80m bands, viz. 3.525-3.625 MHz, 21.125-21.200 MHz and 28.100-28.600 MHz. No cross-band operation is permitted. Stations in the same call area may contact each other for contest credit.

Sections include (a) Phone-novice/full call; (b) CW-novice/full call; (c) SWL. Except for club stations, no multi-operator operation is allowed.

Phone stations call "CQ Novice Contest", CW stations call "CQ N". Exchange a serial number comprising RS (or RST) followed by three figures commencing at 001 for the first contact and increasing by one for each subsequent contact.

Any station may be contacted twice per band, provided at least 12 hours has passed since the previous contact with that station. SWLs may log up to 10 sequential contacts made by a station, and then must log no less than another five stations before logging that station again. The five stations so logged need a minimum of one contact only logged.

Score 5 points for contacts with novice or combined call stations, 10 points for contacts with club stations, and 2 points for contacts with full call stations. SWLs score 5 points for novice to novice contacts, 2 points for novice

to full call or full call to full call contacts, and 10 points for contacts made by a radio club.

Logs must show: Date/time UTC, Band, Mode, Station contacted, Report and serial number sent, Report and serial number received, Points. Each log sheet must be headed "VK Novice Contest 1993". The total claimed score for each page must be shown on the bottom of the page.

Attach a summary sheet showing all standard information (refer to "General Rules & Definitions" published last month). In the case of a club station, the summary sheet must be signed by a responsible officer of the committee, or a licensed operator delegated by the committee to do so.

Entrants may submit only one contest log per mode. Logs for entries where an entrant uses more than one callsign whilst operating in this contest will not be accepted. Send entries to: Novice Contest Manager, WARC, Box 1, Teralba, NSW 2284, to arrive by 23 July 1993.

The Keith Howard VK2AKX Trophy will be awarded to the novice entrant with the highest aggregate (phone and CW) score, and the Clive Burns Memorial Trophy to the novice entrant with the highest CW score (these are perpetual trophies on permanent display at the Executive Office). In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition. Certificates will also be awarded to the top scoring novice stations in each call area, the top scoring station in each section, and to any other entrant where meritorious operation has been carried out. Awards are at the discretion of the contest manager.

Ray Milliken VK2SRM
Novice Contest Manager

VHF-UHF Field Day 1993

One last log has been received for the Field Day — from Eric Fittock VK4NEF. Eric scored a healthy 480 points using 2 metres FM only. Well done Eric.

I would be very pleased to receive any further comments on the possible Field Day rule changes described in last month's issue. After all, the whole aim of the exercise is to give people what they want.

Another suggestion just received is that there should be a second VHF-UHF Field Day at some other time in the year. The proposal was for a mid-winter date, but other possibilities could be in spring, or in early December. (I believe there is a ZL field day in the first or second week of December).

John Martin VK3KWA
VHF-UHF Field Day Contest Manager

ARDF Region 3 Contest Beijing, October 1993

The WIA is sponsoring a team for this event with Wally VK4DO as contest manager. Contestants under 40 years of age are still required.

Approximate cost is $2,500-00.

Full details are available from Wally, VK4DO QTHR.

The closing date is 30th June 1993.

* *Federal Contest Coordinator*
24 Sovereign Way, Avondale Heights, 3034
ar

Club Corner

South East Radio Group Inc

Well, folks, the time is fast approaching when that special weekend in June comes around. Of course I'm talking about the ever-popular South East Radio Group Annual Convention to be held over the weekend of 12-13 June 1993.

The South East Radio Group has set a standard for amateur conventions which is unsurpassed in Australia. A good balance is maintained between trade displays and competitions to ensure that a wide range of tastes is catered for.

This year we are still offering many exciting events which include the Australian Fox Hunting Championships. As has become the practice, additional emphasis is to be placed on the Home Brew competition. Traditionally this competition may not have been very encouraging to beginners to the home brew arena, so we will continue to provide a number of sections to cater for the novice to expert. We hope this will encourage everyone who likes to dabble in home-built equipment to show their prowess and compete for some attractive prizes.

The South East Radio Group convention promises to be a very popular spot on the amateur calendar, so make sure you don't miss out by booking your accommodation early. A list of recommended motels and caravan parks is available by writing to the Convention Co-ordinator at the address below.

Hope to see you there.

Convention Co-ordinator
SERG,
PO Box 1103,
MT GAMBIER 5290

South Coast Amateur Radio Club News

The South Coast Amateur Radio Club Inc would like to invite you to attend the inaugural "South Australian Technical Symposium". This event will be held on Saturday 24 July 1993.

The aim of this event is to promote experimental and home brew aspects of amateur radio today. Thirteen lectures will be presented covering the following topics:

160m Home Brew Equipment (John VK5BJE)
Amateur Microwaves (Des VK5ZO)
Packet Radio (Terry VK5GU and Grant VK5ZWI)
Short Wave Listening (Jerome van der Linden)
Amateur Satellites (Graham VK5AGR and Garry VK5ZK)
6m-23cm Propagation (Eric VK5LP)
VLF/LF Techniques (Lloyd VK5BR)
VHF/UHF Construction and Equipment (David VK5KK)
Home Brew Antennas (Peter VK5TZX)
Politics in Amateur Radio (Geoff VK5TY)

WICEN

The event will be held at the Kingston TAFE College, O'Halloran Hill in Adelaide. Lunch, morning and afternoon teas will be provided, as well as a copy of the notes from all lectures. The presentations will be organised in three streams, allowing a choice of topics to be selected. The WIA (VK5 Div) Equipment Supplies, Kits and Publications will also be available during the day.

If you are interested in attending, please register by 9 July, as places are limited. To register or obtain more information, you can contact Grant Willis (VK5ZWI) on telephone (08) 277 3077, or Peter Cockburn (VK5TGZX) on (08) 276 6703 between 7-9pm CST. You can also send a packet mail message to VK5ARC@VK5TTY.#ADL.#SA.AUS.OC or contact us by post at: SA Technical Symposium, C/- South Coast ARC Inc, PO Box 333, Morphett Vale, SA 5162.

We hope to see you at the symposium!

Grant Willis
Secretary

Radio Amateurs Old Timers Club

The March meeting of the Radio Amateurs Old Timers Club took place on Wednesday 31 March at the Bentleigh Club. Forty-seven members and friends attended.

Members present were advised that Alex Stewart VK3BMS had reluctantly stepped aside as president due to the continuing illness of his wife.

John Fullager VK3AVY, who operates on 20 and 80 metres in the club's monthly broadcasts, has agreed to stand in until the annual meeting in September.

This meeting was historic in so much as the speaker was Alan Campbell-Drury VK3CD who, as VK3ACD, was one of the three wireless operators in the ANARE expedition to Heard Island in 1947/48/49. The member who introduced him was Quentin Foster who, as VK6QF, was the first operator to make contact with Alan, who was using a type A mark 3 transceiver with five watts CW output. This little rig from VK3ACD to VK6QF was the only communication from Heard Island to Australia for a couple of weeks as the high power official transmitters had been damaged by sea water.

Alan and Quentin had not met in the years since that time, so their eyeball QSO was memorable.

A founding member of the club, Lay Cranch VK3CF, had passed away the day before the meeting, but this did not become known until the following day. (See obituary notice in this issue).

Members and listeners are reminded that our monthly broadcast is now repeated at 8.30pm Melbourne time on 3.635 megahertz. The operators are Ron VK3OM and John VK3AVY.

Allan Doble VK3AMD

Cairns and Tablelands Amateur Radio Clubs

If you are thinking of visiting Far North Queensland in the September school holidays come to the Far North Queensland radio convention and meet locals and visitors.

The Far North Queensland Biennial Convention, to be held from 24-26 September 1993. Hosted by the Cairns and Tablelands Amateur Radio Clubs, PO Box 1215, Cairns 4870.

Venue: Ivanhoe's football club hall at Trinity Beach, which is actually 15 minutes drive from the centre of Cairns, and only five minutes drive from the beach.

Accommodation: There are a number of motels, hotels, holiday units and caravan parks within 10 minutes drive from the venue.

Program

Friday:	1800 Get to know you function
Saturday:	0800 Registration
1000	Welcome and opening address
1045	Morning tea
1100	Session number one
1300	Lunch
1400	Session number two
1530	Afternoon tea
1600	Session number three
1750	Socialising, drinks etc.
2000	Conference dinner.
Sunday:	0900 Ladies trip to town departs
1000	Session number three
1115	Auction
1145	Ladies trip to town returns
1200	Convention closure and BBQ lunch
Contact personnel	Chris Parr VK4ANI (070) 510452 Larry VK4WWW
Packet	John VK4JON@VK4AFS. #NQ.QLD.AUS.OC

News from Moorabbin & District Radio Club

The club obtained permission from DoTC to operate the club station VK3APC on HF, VHF and UHF at a site on Mt Donna Buang for the John Moyle field day. David VK3XJP and Trevor VK3JJR were the prime movers, and others assisted and the whole crew did a great job.

The club is now registered as providing examination services. The member to contact is Andrew Bell VK3WAB, QTHR, and he is assisted by Brian VK3EOZ and Jerry VK3MQ. The first two applicants were successful.

On Sunday 3 April and Monday 4 April, small groups of members and friends had conducted tours of the large and little-known radio and radar museum of the Civil Aviation Authority at Essendon Airport. This visit was arranged by Bill Babb VK3AQB by kind permission of the curator Mr Roger Myer, and with the much-appreciated co-operation of Mr Hughie Hopkins, Mr Phil Broderick, Mr Bruce Farr and Mr Ken Matthews, all of whom are Civil Aviation staff.

Allan Doble VK3AMD

NSW Mid-North Coast Field Day

Due to the large crowd experienced last year, the 1993 ORACS Field Day, held over the Queen's Birthday long weekend in June, will be at the Wauchope Showground. Lots of room and good parking.

The event will be over TWO days — Saturday and Sunday 12-13 June. This will give everyone an option of either day to bring or buy their favourite piece of radio or computer equipment. Local and national traders will also have their stands there with the best buys in town. It is also hoped that the ladies will again have a stand of "non-amateur" wares as a "bring and buy" bargain sales activity.

As in previous years, there will be the usual fox-hunt and contests for home brew equipment etc.

The local 2m repeater is on 146.7.

Event brochures and maps of the area can be obtained in advance by writing to: The Hon Sec ORARS, PO Box 712, Port Macquarie, NSW 2444.

We are not the largest field day in NSW, neither are we the smallest — but we are the "friendliest'.

Tel and Fax (065) 85 2647
David A Pilley VK2AYD
Publicity Officer
Oxley Region Amateur Radio Club
PO Box 712
Port Macquarie NSW 2444

Warrnambool Amateur Radio & Electronics Club

The Warrnambool club has grown from just five members in 1988, to 40+ in 1993, and approximately 10+ other amateurs who contribute at any of our special functions.

We have seven licensed examiners with 10 novice students presently undertaking the Novice course. Six students have already passed their Regulations, and the other four were sitting on the 8th April (hopefully all have passed).

QSL Distribution Centre

The WIA has graciously made the club a QSL distribution centre for our area, so if anyone wishes to use the Warrnambool Club as their QSL centre, please feel free to ring the club President, Ian Durston VK3VID on (055) 62 8684, or write to the club WAREC, PO Box 724, Warrnambool Vic 3280.

General Activities

Our monthly meetings are held on the 3rd Tuesday of each month at 7.30pm. The venue being at the SEAL Complex, 71 Hyland Street, Warrnambool. Each month we try to have special guests who are both informative and practical.

We produce a monthly magazine, which is sent out to all members and interested persons, with such information that concerns the club and surrounding district activities. Advertising in this magazine is free, with a distribution radius of 150 km. If you have transceivers, receivers, antennas etc for sale, please forward the information to the secretary.

Membership

Our annual membership fees are very much in line with other clubs being $15-00 for full membership, and $5-00 for pensioners, unemployed or students. Family membership is $25-00. The membership fee entitles members to the monthly magazine, discount facilities at a couple of local electronics stores, plus numerous other advantages that come from belonging to a club.

73
Marilyn Durston
Secretary WAREC
PO Box 74
Warrnambool Vic 3280
ar

Awards

John Kelleher VK3DP Federal Awards Manager

First a reminder about two VK8 Awards from Alan VK8AV:-

The Outback Award — requires 3 QSOs with members of the Alice Springs ARC or 3 QSOs with the same member on 3 separate occasions;

The Rev John Flynn Award — is in memory of Flynn of the Inland and has the same QSO requirements as the above. Fees for the Award are $5.00 in any currency. The above requirements are not strictly enforced.

Applications for these awards should go to:
The Awards Manager
ASARC
Box 2953
Alice Springs NT 0871

From Bob VK4DRM comes news and a sample copy of the "Moreton Bay Boating Paradise Award", which is awarded by the Bayside District ARS.

To qualify for this Award, VK stations must earn a total of 5 points (DX Stations require only two points) by working individual club members or joining the Club Net which is run every Wednesday at 1930 UTC on 21.180 MHz +/- QRM. Club station VK4BAR is worth 2 points, a Club Member station is worth one point.

Applications including a copy of the log showing name, address, callsign, and details of date, time, band and stations worked should be sent to:
The Awards Manager, Bob VK4DRM,
C/o BARS
PO Box 411
Capalaba QLD 4157

Please include $5.00 to cover cost of Award and postage.

Lithuanian Awards

Two Awards are offered:-

LY-Trophy

This award is available to any amateur confirming two way contacts with LY stations. Oceania stations require 5 station contacts. You must send GCR list and $US5.00 or 10 IRCs or equivalent.

Baltic Way

The Baltic Way award is available to any amateur confirming two-way contacts with three Baltic States: ES (1 QSO), LY (1 QSO), YL (1 QSO) in 24 hours. Send GCR list and $US3.00 or 6 IRC or equivalent. The same rules apply to SWLs.

Applications should be sent to:-
Award Manager
PO Box 1000
Vilnius, 2001
LITHUANIA.

ar

IARUMS — Intruder Watch

Gordon Loveday VK4KAL *

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

UMS Reports

The IARUMS is asking for reports of UMS on 7008 kHz for March and April 1993. Possibly not much will come from the VK area, as the station is in MURMANSK ! (still, the move is a good one).

The Chinese station normally found on 14058 kHz has now moved down to 14053 kHz, and still continues to send marker pulses and data.

Each month sees an increasing number of "Letter Beacons", mainly in the 40m band.

Now who said Intruder Watching was uninteresting? It is a good means of filling in time, while you wait for your sked. Try it!

Monitoring Service Update

Broadcast station on 7020 kHz is being constantly jammed and is a good example of how effective jamming can be.

The interference occuring around 14250 kHz has been identified as Radio Korea, sited at Pyongyang.

Please remember that the 80 metre band is shared and is therefore legitimately used by non amateurs.

Good News

RSGB reports that the NATO Naval data station often reported on 18081 khz has shifted as a result of the co-operation between RSGB Monitoring System and UK authorities. This popular CW frequency is now the exclusive domain of amateurs again. Another win for the IARUMS.

SARTS MS Co-ordinator 9V1JY reports that as well as the Chinese Military data bursts on 14053.5 kHz, a station using the same methods (marker pulse and data bursts) has been logged a number of occassions on 14063.5 kHz A CW station ID VVH is being heard in R3 daily on 21368 kHz.

Jamming is being reported on all bands by JARL. More info is being sought to try and identify the source.

Frequency Occupation Survey. Richard Baldwin W1RU, President of IARU extends his congratulations and thanks to all those MS members who participated.

Now some more on Jammers

Stepped tones

Those signals usually consist of 3 or 5 separate audio tones transmitted in the order of first increasing and then decreasing pitch, repeated over and over again.

Random noise

Noise is random, both in amplitude and frequency. Since recurring frequency, it cannot be filtered out or otherwise eliminated without removing the desired signal. It produces a sound similar to that heard when a receiver is not tuned to a station and the volume control is turned to maximum.

Random keyed modulated CW

This signal consists of a continuous wave keyed at random and modulated by superimposed spark noise.

Rotary

This signal is produced by a low pitched, slowy varying audio freq. The result sounds like grunting.

Gulls

Consists of a quick rise & slow fall of varied audio frequency. The sound is similar to the call of a seagull.

Pulse

The sound of this signal resembles the monotonous repetition of high speed machinery, repetition rate is usually constant.

Tone

Consists of a single freq of unvarying tone. Most often used to jam modulated transmissions.

Wobbler

Is a single frequency, modulated by a low, slowly varying tone, resulting in a howling sound.

This information was supplied by Rohan Wahrlich ZL1CVK, Region 3 MS Co-ordinator.

For the beginning of Jammers see April AR. I hope the information will help observers, and let all those others become more aware of the need to continually monitor our hard won frequencies.

Listed below are lists of recently logged intruders into the amateur bands:-

Summary of Intruders for February 1993

Freq	UTC	Date	ID	Mode	Comments X
7002.5	1145+	180293	V	A1A	Beacon 33
7005	1111	205293	—	A3e	Indonesan b/c stn
7039	2045	120293	C	A1a	Beacon 2
7029.4	1115+	180293	F	A1a	Beacon slow cw 15
7048/9	2035	110293	UHF3	mxd	F7b/F1a, 5 fig gr 30
10102	1135	180293	LRB74	A3c	Wx fax. Drum sp 120 rpm
10110	2112	120293	—	F1b	Data 140 bd sync 3
10115	2020	130293	—	A3c	Wx fax China 2
10120	0650	100293	—	A3j	American fishermen
10142	2115	120293	—	F1b	Data 140 bds sync
14053+	0718+	010293		mxd	Non, F7b data bursts 12
14056	1100+	180293		mxd	as above, Chn 28
14128.5	0957+	010293+		F1b	rtty +non 8
14140.5	0510	230193+	MNR	mxd	UMS group 250hz, 80bd CIS 14
14210	1133+	180193		A3e	2f of 7105 35
14211/5	1130+	180193		F1b	2 sigs 3rd reg cyr CIS 11
14220	0930	230293		R7b	
14238	0535	190293		R8b	
14282.2	1155+	260193	VRQ	A1a	tfc & calling MKHJ, UCP VTn
14288 as above, showing spread of tranmx 30 loggings					
14250	mny	daily		mxd	Pxxx + non, jam 5/6 kHz
21009/15	mny	daily		non	Carrier varies 6 kHz 18
21031.5	mny	daily	MNR	mxd	a1a/f1b UMS group CIS 16
212893.5	mny	daily	MNR	F1b	RTTY, 110 bds sync CIS 20
21315	0547	080293		R7b	4kHz wide
21368/9	mny	dly	VVH	A1a	I.D. brd 9
21448/50	1134	dly	R.Mos	A3e	B/c stn ? tail end of id?
24925	0912	060293	Tass	A1a	c/s x 3/AJOL FXU &C
24942	0132	0602		A1a	Marine radio tfc. HKong, 2f?
24950	1036	1302		A3e	B/c stn Chinese lang 2
28350	0725	170293		A3e	B/c stn Russian dialogue

Many PXX and NON signals heard of late, mostly OTHR.
Logs this month from VKs 4BG, 4AGL, 4AKX, 4BXC, 4BTW, 6RO and 6XW.

Summary of Intruders for March 1993

Freq	UTC	Date	ID	Mode Comments X
7002.5	1200	220293	A1A	V BEACON 21
7039.5	1055	220293	A1A	F BEACON + C BEACN 30
7048	1050	220393	MXD	UHF3 ON F7B + F1CW 5
7049	2100	1903	MXD	F1B/DATA 140 BD SYNCRO 2
10103.3	1133	210393	A1A	SERIES LONG DASHES
10115	2130	1803	A3C	WX FAX DAILY CHN 30
14002.6	1018	0203	J3E	B/C ASIATIC SP
14006/8	1305	2303	XXX	JAMMER
14018.4	1023	020393	A2A	CODED LTRS/DATA
14061.5	0720	0503	MXD	F7B/NON/DATA BURSTS 16
14033	0540	1803	A1A	LONG SERIES DASHES
14040.5	0710	220393	F1B	140 BAUDS SYNCRO
14053	0755	2203	F7B	DATA BURSTS DAILY 17
14105	0043	2303	F6	2 DIFFERENT TONES
14117.2	1110	080393	NON	STEADY CARRIER
14125/7	MNY	MNY		3 TX TOGETHER/RTTY CIS
14140.5	MNY	DLY	MXD	UMS CHAIN 140BD CIS 27
14210	0050	0103	A3E	CHIN FEMALE 2H/7105 18
14212	1003	080393	F1B	RTTY NO SHIFT GIVEN 4
14214.5	1030	0503	MXD	A1A/F1B FIG GRPS
14250	MNY	DLY	NON	PLUS JAMMER 14
14283	1312	2803	A1A	UMS/F1B FIGS CIS 2
14285/7	MNY	DLY	A1A	VRQ MSGS /TFC VTN 31
14338	2230	190393	A3C	WX FAX
21031.5	MNY	DLY	F1B	UMS GROUP 250HZ FIGS CIS 17
21283.5	1050	2202	MXD	MAIN OUT UMS CHAIN CIS 12
21315	1207	1903	A3E	B/C STN MUSIC
21406	0130	010393	A3E	RADIO MOSCOW CIS 5
24900	1159	1803	F3	B/C FM MODE
24928	0158	0103	A1A	MARINE SHIPPING TFC
24962	1223	0103	A3E	MILITARY TX ASIA

Many military transmissions are heard around the 24.960 MHz area, also in the 10m band, also harmonics (?) of lower broadcasters, or are we hearing fundamental freqs in these bands now?

Logs included this month VK's 4BG, 4AGL, 4AKX, 4BTW, 5TL, 6RO, and 6XW.

Many thanks,

VK4KAL FIWC

* *Federal Intruder Watch Co-ordinator Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4UN-1*

ar

FTAC Notes

John Martin, VK3KWA, FTAC Chairman

New VHF-UHF Records

There are several new VHF-UHF records to announce this month, three of which were made during the VHF-UHF Field Day on January 15/16.

Chris Davis VK1DO has broken the ACT record for 1296 MHz twice, and 432 MHz once. Operating as VK1WI/P, Chris worked Arie Groen VK3AMZ on 14/3/92, for a new VK1 1296 MHz record distance of 507.1 km. On 15/1/93, he operated from Mt Ginini and set new ACT records for 432 and 1296 MHz by working Ross Barlin, VK2DVZ over 542.8 km. Congratulations to Chris, Arie and Ross.

Rod Preston VK4KZR and Doug Friend VK4OE set a new Queensland record for 1296 MHz on 16/1/93. Rod operated from Mt Mowbullan and Doug's station was near Siding Springs in the Warrumbungles. The distance was a very healthy 544.7 km.

Wal Howse VK6KZ and Ross Tolchard VK6KAT have claimed the first ever 10 GHz record for Western Australia. On 28/2/93, Wal operated from the Cape Naturaliste lighthouse and Ross was on the highway between Roelands and Collie. The distance is 85.1 km. Both stations used ex-military tellurometers model MRA301.

Warning of possible RF Safety Hazard

Lyle Patison VK2ALU, who is FTAC's microwave advisor, has provided this warning on the use of 10 GHz tellurometers:

These tellurometers use a klystron with a CW power output of about 10 mW, and have a 317 mm dish with a stated gain of 27 dBi. This represents a likely ERP of about 5 watts, which would result in a power density of about 6 mW per square centimetre at the dish aperture. With the cassegrain reflector unclipped, the power density would be about 4 mW per square cm.

Both of these densities are above the recognised safety limits.

A tellurometer should not be operated indoors on its tripod, or outdoors when access is available to the front of the device. This could put people — especially children — at risk because the source of RF radiation would be very close to eye level.

A further warning: do not remove the subreflector and look into the open end of the waveguide when the device is operating.

Pager Interference — Light in the Tunnel?

Two American firms, Scientific-Atlanta and Motorola, are about to begin production of equipment for the IRIDIUM global communications program.

This is a world-wide, cellular, personal digital communications system for use with low earth orbit (LEO) satellites. The first satellites are to be launched in 1996 and the system is expected to be complete by 1998.

The good news for amateurs is that the LEO satellites, which will orbit the earth at an altitude of about 780 km, will use the bands 135 — 138 and 148 — 150 MHz, which were allocated at the last WARC. The higher of the two bands conflicts with the Australian pager band, and it seems inevitable that the pagers will have to be moved.

Almost all channel 5A TV stations are already scheduled to move during the next few years, but the use of 135 — 138 MHz by the LEO satellites will help to guarantee that the move goes according to schedule.

Microwave Pay TV

New Zealand amateurs recently lost most of their 13 cm band when their government decided to sell off 2300 — 2398 MHz to the highest bidders.

Now the same thing is about to happen here.

As well as satellite pay-TV, we will soon be saddled with microwave pay-TV using the existing MDS band — despite the fact that ground-based microwave systems just cannot provide the broad area coverage needed for public broadcasting.

It appears that known technical facts do not carry any weight when the profit motive comes to the fore.

Our 2300 — 2450 MHz band is shared with other services, including fourteen MDS channels between 2302 and 2400 MHz. Once these channels are sold for pay-TV, the MDS services will have to find space elsewhere, and this could pose a threat to 2400 — 2450 MHz as well.

It may be too late to prevent this squandering of a public resource for private profit, but there is a chance that the government may reconsider if they can be persuaded that the MDS proposal is technically impractical.

I would urge all amateurs interested in preserving this band to start writing letters.

ar

Prevent pirates — make sure you sell your transmitter to a licensed amateur.

Pounding Brass

Gilbert Griffith VK3CQ

CW Increasing!

A great deal of time and effort went into adjudicating this year's 43 events. Interestingly, the number of UK entrants in CW contests is increasing whilst SSB contests are struggling.

Morsum Magnificat

Comment on HF contests in the Annual Report of the Radio Society of Great Britain, 1991-1992. courtesy Morsum Magnificat #26. Also in Morsum Magnificat #26, is the following article.

"The first ever UK Class "A" Novice, has now become the first UK Novice to receive the G-QRP Club's Class "A" CW Novice Award.

He is 12-year-old Keith Goodwin, 2M0ACT, who used 3 watts to make his first 50 CW contacts to qualify for the award. These contacts include seven with USA/Canada, two with Indonesia, and involve twelve separate countries in all.

His father Stuart GM0CAG, reports that Keith is getting a great thrill from the hobby and that many of his contacts have helped him relate to his school geography and French lessons.

Dave Gosling G0NEZ, the G-QRP Novice Services Manager, reports that there are a number of other Club Novices also achieving high standards of operating ability and asks all CW operators to look out for and encourage Novices when they hear them.

Novice callsigns have the prefix 2 followed by the letter E, W, M, J, U, or I designating their regional locations. 2M0ACT, for example, is located in Scotland.

The G-QRP Club's CW Novice Award is intended to encourage newcomers to CW operating. It is open to any amateur (including non-club members) who, during the first twelve months of holding a licence, contacts 50 different stations while using CW.

The Class "A" award is for contacts using up to 5 watts output and the Class "B" award any power may be used. Further details are available from Gus Taylor G8PG, 37 Pickerill Road, Greasby, Merseyside, L49 3ND, England."

Increasing Your Speed.

This is not everybody's cup of tea, many of us are quite happy thank you, to plod along at 10 wpm or so. But if you have other ideas, maybe a hankering for some rare DX, or contest fever, you may want to do a little better. I know if I ever manage to get back into the shack I will certainly need to get my speed up all over again, because I sure am rusty.

By far the best way to improve your copying ability is to copy, off air, as much as possible. If your aim is to improve your speed, then you should aim at trying to copy a little faster than you can at present. Naturally you are going to miss things, but many operators have found that if they set themselves high goals they will eventually achieve them. If you set your goals too low, you will achieve them, but where will you be then?

Due to the pressure of business, Gilbert Griffith VK3CQ has advised that this will be his last column of "Pounding Brass".

The Editors and the Publications Committee thank Gilbert for the untiring voluntary effort he has displayed over the past five years. An endeavour very much appreciated by all of us at "Amateur Radio".

Morse Code is a very important part of our hobby, and we now solicit expressions of interest from enthusiasts prepared to write the "Pounding Brass" column. Please phone (03) 528 5962, or write to the WIA, PO Box 300, Caulfield South Vic 3162.

Depending upon which level you require will decide your present goals. The goals might be Novice 5wpm first, followed by full call 10wpm, then you might want to get over the 10-15wpm hump that confounds many beginners. Or you might just want to get your speed up so that you can use CW effectively on the air, the goals you set here will depend on whether you want to work contests, DX, or computers. If you can get a computer to copy your code at any speed then you have achieved a worthwhile goal, because they are extremely unforgiving of sending errors where a human operator will scarcely notice them. Many experienced CW operators will tell you that it is better to set out to learn to copy effectively off air right from the start. You will then have no trouble at all with the exams, but if you only set out to obtain a pass in an exam you will still have to learn how to receive off the air later on. A goal that many amateurs never achieve at all.

Don't be frightened by the so-called "sound barrier" in learning Morse code. Many operators get to the speed of about 10wpm and are convinced that they cannot go any further. This is because of the three ways of copying code, and the barrier consists of learning each new way as your speed progresses. The first means of copying is that which everyone learns right at the beginning, and involves painstakingly copying down each letter as it is heard. The process can be observed by merely thinking about it.

The brain hears the character and looks it up in its memory, when it recognises the character it says "Aha that is a 'C' " and then tells the hand to write down the "C". This process is actually all right for most exams and for speeds up to about 12-15wpm... that "sound barrier" mentioned before. Once this barrier is reached you need to change to the second method of copying before your speed will show much improvement. The second method is called "character recognition" (the first method was "character look-up"). Here the sound of each character is instantly recognised and the hand writes the character down without any intervening thought processes. At this stage it really helps a lot if you practice listening to characters sent at a MUCH higher speed than you are used to, it doesn't matter if you miss 50% of the copy, in fact this is a good point to aim for because it means you ARE copying at least 50% of the message at a lot faster than you are used to copying. It wont be long before you find yourself able to copy those 20wpm tapes that used to be meaningless, or that you are following conversations at well over 20wpm with ease.

At about this time, without your being conscious of it, you brain will begin to recognise words and phrases as single entities. You may notice that "dah didididit dit" begins to sound like the word "the', and DE and RST will take on meanings of their own.

Eventually you will recognise most commonly used words without even thinking about them, and when an unfamiliar one comes along your brain will be able to "play back" the unknown word until it is recognised. The transition to this third *method*, called phrase recognition, is usually so slow that it goes un-noticed but somewhere about this time you will notice that you can comfortably relax and simply "listen" to the code while "hearing" the words and phrases in your mind, without the necessity of writing it all down.

You will be pleased to discover that your receiving speed is now so great that you cant write fast enough to keep up.

* *7 Church Street, Bright Vic 3741*

ar

NZART

BASIC RADIO TRAINING MANUAL
Single copies may be purchased from NZART,
PO Box 40 525,
Upper Hutt NEW ZEALAND
The correct single copy price:
NZ$21.75 including postage
10% discount on bulk orders of 10 or more
20% discount on orders over 20

This revised edition was reviewed in the Education Notes in February "Amateur Radio". **ar**

STOLEN EQUIPMENT

YAESU FT/290 RII, serial number 9F240010 2m FM/SSB transceiver.

Stolen from V Rochfort VK2BVR of 32 Craig Ave, Oxley Park, NSW at around 2pm on 10 March 1993 . Phone (02) 623 6376 or (02) 283 2444. Contact Constable Fathing at St Marys Police station.

ar

ALARA

*Robyn Gladwin VK3ENX **

Future YLs at Geelong

Geelong Amateur Radio Club has begun an NAOCP class (CW, theory and regulations) for women and younger youth, ie 11-14 year olds. It is held on Wednesday evenings from 7.30 — 9 p.m. at the GARC clubrooms. Already there are 5 YLs, 2 boys aged 12 and 14, and a prospective YL aged 14.

The fees for the course are just club membership with concessions for pensioners and students. Towards the end of the year, the club hopes to run a special examination for this group with minimal fees as added encouragement.

Many thanks to Lee VK3PK for this information.

Maybe, other clubs will take up similar initiatives in order to keep our hobby alive in years to come.

ALARA Out and About

ALARA has been represented at a number of amateur radio events. Dorothy Bishop VK2DDB attended the Gosford Field Day at the Wyong racecourse. The ALARA display was located on the first floor of the airconditioned members" stand, and many YLs, either studying for their licences or interested in beginning a course, spoke with Dorothy. Among the YL amateurs at the Field Day were Beryl VK2BBM, Pixie VK2KPC, Marjorie VK3AMJ, Pauline VK2GTB, and Anne VK2MKJ.

ALARA was also part of the Barossa Amateur Radio Club Picnic at Mount Pleasant oval. This year, a section of the main hall was partitioned off as a "drop-in" centre and Maria VK5BMT, Meg VK5AOV, and Christine VK5CTY dispensed tea and coffee to ALARA members and interested visitors. Sighted at the Picnic were Lyndell VK5KLO, Sue Mahoney, Chris VK5TCC, Bev Tamblyn and Mary Rogers.

The ALARA banner flew at Mount Pleasant and is now on its way to Mildura where it will fly at the Two States — Sunraysia and Riverland Radio Groups Combined Convention on Saturday, 15th May, 1993.

YL meeting '93 in Osaka.

Christine Armstrong ZL1BQW has gone to Japan for the JA-YL Meeting. She has taken a set of souvenir spoons collected from different Australian call areas. Many thanks go to Poppy VK6YF, Bev VK6DE, Alan VK8AV via Maria VK5BMT, Meg VK5AOV, Helene VK7HD, Bron VK3DYF, Dorothy VK2DDB, and Val VK4VR, who donated spoons for this special occasion.

Young Amateurs

Speaking of young people, VK5 ALARA members held an evening to welcome Adele Hope ZL1TMD a Rotary Exchange Student. Adele is 14 years old and has been made a sponsored ALARA member for 1993. She is looking forward to receiving her reciprocal licence. Adele, centre, is pictured at the Chinese restaurant with Jennifer, daughter of Lyndell Oates VK5KLO, and Michelle, daughter of Joan Harris. Joan is presently studying for her amateur licence. Perhaps Jennifer and Michelle will be future ALARA members.

Another young amateur, Hirotsugu Tahara JM6EAW, aged 11, was welcomed to Australia by VK3 ALARA members in Melbourne. He and his mother, Akemi JK6ARD were on their first visit to Australia.

Pictured with the guests are, from left, Raidie Fowler, Robyn Gladwin VK3ENX, Mavis Stafford VK3KS, Phyl Burstal VK3KYL, Erika Bartz VK3AEB, and Gwen Tilson VK3DYL.

33

** PO Box 438 Chelsea 3196 VK3ENX@VK3YZW*

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Chuckie's definitely NOT a ham

I am one of those amateurs who, amongst the 2m and 70cm mobile FM amateur equipment, also has a popular brand mobile phone installed in my vehicle for business usage.

Things were going along quite OK, until I installed a mobile phone antenna on the rear window of the car, alas only approx one metre from the two metre quarter wave vertical antenna mounted in the centre of the roof.

On four occasions so far, I have succeeded in completely wiping out the memory settings of the mobile phone whilst transmitting 50 watts on 2m FM. On one occasion, the mobile phone really spat the dummy, as it lost ALL software settings, necessitating a visit to the dealer for a complete re-installation. The dealer was quite puzzled, and he had never heard of RFI, or Electromagnetic Compatibility (EMC). He mentioned that this was the third mobile phone re-installation he had performed during that week, and thought it a most strange event, but had no explanation for the cause of the problem.

Try as I might to explain the circumstances to the dealer, he found it very difficult to accept that the mobile phone obviously has a weakness in the front end, lacking in selectivity, and being unable to reject a strong nearby signal.

I bring this matter to the attention of other amateurs who may be contemplating a similar installation, with a warning to ensure the mobile phone is at least covered by a guarantee against disintegration by strong local electromagnetic fields.

Finally, a message to Telecom's Chuckie:- Amateur Radio Operators are very adaptable to most situations, and who is qualified to work out all of the intricate details? .... we are Chuckie, we are!!

Bruce Bathols, VK3UV
6 Ann Court
Aspendale Vic 3195

AR layout changes

It looks very neat. The reduced size of print for the regular columns is a good idea and will allow more information to fit in the available space.

On the other hand, unless my eyes deceive me, the size of print for the technical articles has been increased again. Does this mean that the number of pages will be increased, or that the number of technical articles will be reduced?

John Martin, VK3KWA

Foreign Words

Personally I'm not too concerned whether Will McGhie (page 47 March AR) uses ANALYSER or ANALYZER, although I've never seen ANALYSIS spelt with a "Z", so perhaps that's why I prefer the look of "S", BUT I really must protest about the use of the non-existent word "LOANED" on page 26!

Admittedly, we are constantly being besieged with overseas reports, documentaries and films where LOAN (a noun) is used as a verb instead

of LEND, and that aforementioned word used instead of LENT; but we don't need to copy.

Australian (English) does not have the word LOANED in it; the word did not exist when I went to school, and you won't find it in the Australian Macquarie Dictionary today either!

If the original article on Hurricane INIKI had been written in, say, German, I'm sure it would have been translated into Australian so that most of us could read it. A little translation may have been appropriate here too!

Dick Smith Electronics may well have LENT Amateur Radio equipment, but I'm sure it never loaned (ugh) it!

Murray Burford VK5QZ
261 Belair Rd
TORRENS PARK 5062

Editor's Note — Humble apologies, Murray. I should have checked my Macquarie ... VK3ABP.

Tape Version of AR

When reading the publication "Magazines for print-handicapped readers" I came across the following entry:

Amateur Radio
Monthly
4-track audio cassette
Produced by the Royal Victorian Institute for the Blind
Free
For amateur radio buffs. Complete copy of the print edition

Not once in the years I have subscribed to the print edition of *Amateur Radio* have I seen mention of this taped edition!

In my work as Extension Services Librarian — for people with disabilities — I contacted Linley Wallis, the chief librarian of RVIB, to confirm that this facility is still available. And, in doing so, discovered there are 49 subscribers to the taped edition.

I wonder whether there might be more subscribers to the taped edition of Amateur Radio if the opportunity were taken to publicise its availability through the paper. What about an article regarding the subscribers" use of this format of the journal? By doing this, there may be readers who are able to introduce this taped format to some amateur operators who have difficulty reading the print format.

Elizabeth Pennington VK3NEP
32 St Georges Rd
Beaconsfield Upper 3808

Editor's Note — Many thanks for the information Elizabeth, we also were not aware that AR was being produced in the format listed as a regular event ... VK3ABP.

ABC Radio Traveller's Guide

I have recently received some information from ABC Radio which may be of interest to other amateurs who are also regular travellers like my husband Keith VK5MT, and myself Maria VK5BMT.

The Traveller's Guide to ABC Radio is an extensive publication that suffices when one is actually in the location of the local transmitter. However, there have been many occasions when we have tried to find the usual regional ABC programming like news and current affairs and also Australia All Over, when we were out of reach and have found that the HF Short Wave Services are more numerous than listed in the Guide.

There are HF services on VLM4920 and VLQ9660 in Queensland. VLW6140, VLW9610 and VLW15425 in WA, as well as VL8K Katherine and VL8T Tennant Creek, NT.

As amateurs with HF sets and aerials we found good reception in all locations on the WA frequencies while in that state last year and hope others may benefit from this information.

(Mrs) Maria McLeod VK5BMT
1 Hawkins Ave
Flinders Park SA 5025

It Can't Happen to Me!

During a violent storm our home was struck by lightning. Fortunately I have always switched my roof-mounted vertical to ground when not in use — it was hit. I had thought the 25m high tower with numerous VHF and UHF antenns, just 100 metres uphill from us, would be the lightning target before us. I now know better!

Most damage seems to have occurred through the AC mains. HF and VHF rigs with AC PSU, and a number of household items were damaged; some beyond economical repair.

My return to the bands is now dependent on the kindness of the insurers. It DID happen to me!

Charles Allen VK2ALC
92 Beacon Hill Rd
Beacon Hill NSW 2100

PS: I like the new format of AR.

ar

Spotlight on SWLing

*by Robin L Harwood VK7RH **

I recently obtained a copy of the *1993 World Radio TV Handbook*, published by Billboard. This edition was published in early January, but I was only able to get my copy through one of the major electronic chain stores. The 608 page handbook contains all the usual features, but it is worth noting that the the WRTH editorial staff has compiled other books such as *"the WRTH Equipment Buyers Guide" and "The Traveller's Guide to World Radio"*. These two new publications are designed for the listener/DXer, whilst the Handbook proper seems to be increasingly oriented towards the professional broadcaster rather than the hobbyist interested in Dxing or casual listening. Yet it still has a wealth of information on shortwave broadcasting stations that isn't found in any other source, especially on those smaller broadcasting outlets that often are low powered and hard to catch.

This 1993 edition does look different, because of the momentous political changes in eastern Europe and the former Soviet Union.Because the latter no longer exists, each nation is now listed separately, together with the broadcasting information. As well, the media scene is rather fluid and there is quite a deal of indispensible information on contact points and frequency usage. Most former Soviet states have rapidly developed their own broadcasting services, both internally and externally.

In past editions, there usually was an equipment review and this edition does have a smaller section. More extensive reviews are included in the separate *"Equipment Buyer's Guide"*. All the other sections are included, such as satellite broadcasting services.

A new section at the back is devoted to clandestine broadcasting. Overall, the WRTH 1993 is invaluable, despite some of the shortwave information quickly becoming outdated. This naturally happens as the shortwave scene can rapidly alter, yet the Handbook still has a wealth of useful and needed data. The price is around $40, from Dick Smith Electronics.

In March, Radio Moscow's English Service briefly carried a news item that the Russian government was going to establish their own external service. Apparently the World Service and the other foreign language programming is apparently funded by the CIS secretariat. There is speculation when and if this comes about. Interestingly, the former "Mayak" and "Orbita" domestic networks, which are still carried through many of the "Commonwealth of Independent States" is funded from a similar source.

If the "Russian Wave" as the new Russian external service is reportedly going to be known only the future will tell. The external service in Russian on shortwave is operated by a separate company to that of Radio Moscow. Confused? Then welcome to the club!

African signals have been propagating into my receiver lately. The BBC Portuguese Service via Meyerton in South Africa is heard at 0530 UTC on 15105 kHz.The signal level varies from daily and it is a good beacon to southern Africa. As well, the VOA relay in Botswana is heard often on 15600 kHz in English between 0500 and 0700. Also the BBC Indian Ocean relay in the Seychelles comes in well around 0430 UTC with BBC World Service from Africa, until an unidentified Arabic programme comes up 30 minutes later.

There is a relay of Radio Japan on 7230 kHz between 0600 and 0800 from the BBC site in Skelton (UK).Signals here are very good at that time. As part of this co-operative agreement in sharing of transmitter facilities, the BBC is utilising the Yamata site to relay their Mandarin Service. Also Radio Japan reportedly has commenced using the BBC Far Eastern relay station in Kranji (Singapore) to get programs to the Japanese contingent in Cambodia with the UN forces. I don't have the time or frequency information yet.

Well, that is all for this month. Don't forget, you can reach me on Packet as follows : VK7RH @VK7BBS or at the address at the foot of this column.

Until next time, the very best of listening and 73 — VK7RH.

* *52 Connaught Crescent, West Launceston Tas 7250*

ar

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used to make these calculations is 68.9. Next month's predicted value is 65.9.

ar

Tx : VK EAST Rx : AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.4	11	8.3	6	-9	-26	...	...
2	10.0	5	7.8	4	-8	-23	...	...
3	9.6	-3	7.4	1	-9	-23	...	...
4	12.5	1	9.8	3	0	-9	-23	...
5	18.0	6	13.9	1	6	3	-3	-13
6	22.3	6	17.2	0	7	7	3	-4
7	21.5	6	16.1	1	7	7	2	-5
8	19.5	7	14.6	4	7	5	-1	-10
9	17.0	7	12.8	6	7	2	-7	-19
10	14.7	8	11.0	8	4	-3	-16	-31
11	12.7	9	9.5	8	0	-10	-27	...
12	11.4	11	8.4	8	-4	-18	-39	...
13	10.6	16	7.9	8	-8	-25	...	...
14	10.2	23	7.5	9	-11	-31	...	...
15	10.0	27	7.4	10	-12	-34	...	...
16	10.0	29	7.4	10	-13	-35	...	...
17	10.0	30	7.5	10	-13	-38	...	...
18	9.6	31	7.2	8	-17	...	...	...
19	9.0	32	6.9	5	-23	...	...	...
20	9.2	32	7.0	6	-21	...	...	...
21	9.6	31	7.3	7	-18	...	...	...
22	9.2	30	7.1	5	-22	...	...	...
23	8.7	22	6.8	1	-25	...	...	...
24	6.9	14	7.0	1	-20	...	...	...

Tx : VK EAST Rx : EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.9	14	10.8	14	12	6	-4	-16
2	15.1	16	10.3	16	12	4	-7	-20
3	14.4	18	9.9	19	12	3	-10	-25
4	13.8	21	9.5	20	11	1	-14	-31
5	13.5	26	9.4	24	12	0	-16	-35
6	14.2	24	9.9	24	14	3	-12	-29
7	16.0	23	11.1	26	18	9	-3	-17
8	15.6	17	11.6	19	12	3	-9	-24
9	13.0	11	9.9	11	4	-4	-19	-36
10	12.0	2	8.8	5	0	-9	-23	...
11	11.2	-6	8.2	1	-2	-10	-24	...
12	10.7	-13	7.8	-1	-3	-10	-23	-38
13	10.5	-18	7.8	-2	-3	-9	-20	-35
14	10.4	-21	7.7	-4	-3	-8	-18	-32
15	10.4	-30	7.7	-9	-7	-12	-22	-37
16	10.0	...	7.5	-15	-13	-18	-30	...
17	9.4	...	7.1	-22	-20	-26	...	...
18	9.5	...	7.3	-19	-17	-24	-37	...
19	11.4	-18	8.3	-5	-2	-6	-15	-27
20	15.0	-5	11.8	-7	-1	-2	-8	-17
21	19.0	3	13.6	-5	3	3	-1	-8
22	18.5	8	12.7	2	8	7	2	-5
23	17.6	11	12.0	8	10	7	0	-8
24	16.6	12	11.3	12	11	7	-1	-12

Tx : VK EAST Rx : SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.2	24	21.2	34	35	33	29	23
2	28.3	24	21.3	35	36	34	29	23
3	28.1	24	21.2	36	36	34	29	23
4	27.7	25	20.9	38	38	35	30	23
5	28.4	26	19.9	42	39	35	29	22
6	24.3	29	18.4	47	41	36	28	18
7	21.7	31	16.4	47	39	32	22	11
8	19.2	33	14.5	45	36	27	15	2
9	16.8	36	12.7	43	32	21	6	-8
10	15.2	37	11.4	40	27	15	-1	-18
11	14.3	38	10.7	39	24	10	-6	-25
12	13.5	39	10.1	37	21	7	-11	-31
13	13.0	40	9.7	35	19	4	-15	-36
14	12.6	40	9.5	34	17	2	-18	...
15	12.5	40	9.4	34	16	1	-19	...
16	11.6	41	8.8	30	11	-5	-27	...
17	10.3	43	7.9	25	3	-16	...	...
18	10.1	43	7.8	24	2	-17	...	...
19	12.9	39	10.0	34	18	3	-16	-37
20	18.2	31	14.0	39	31	23	11	-2
21	23.0	27	17.7	38	35	30	23	14
22	25.8	25	19.7	37	36	32	27	19
23	26.8	24	20.4	35	35	33	28	21
24	27.7	24	20.9	34	35	33	28	22

Tx : VK EAST Rx : ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.5	12	20.2	11	17	17	14	6
2	26.8	11	20.9	9	16	17	14	6
3	27.1	11	20.8	9	16	17	14	9
4	27.4	12	20.8	10	17	18	15	10
5	27.4	12	20.9	12	19	19	16	10
6	26.7	13	20.4	15	20	19	15	9
7	25.1	14	19.2	20	22	20	14	7
8	22.9	18	17.4	28	25	20	11	1
9	20.9	19	16.0	34	26	18	7	-6
10	18.8	21	14.3	34	23	12	-2	-18
11	17.3	22	13.1	32	19	7	-10	-29
12	16.4	23	12.4	31	16	2	-16	-37
13	15.7	24	11.9	29	13	-1	-22	...
14	15.0	24	11.5	28	10	-5	-28	...
15	14.3	25	10.8	25	6	-11	-35	...
16	13.9	25	10.6	23	4	-14	...	...
17	12.6	26	9.7	18	-5	-27	...	...
18	10.7	27	8.2	6	-24	...	...	...
19	10.2	27	7.9	2	-30	...	...	...
20	13.4	25	10.1	21	0	-19	...	...
21	17.8	21	13.9	30	20	10	-4	-20
22	23.9	15	18.5	23	23	20	13	4
23	25.9	13	19.9	18	21	20	15	8
24	26.2	12	20.1	13	19	18	14	8

Tx : VK EAST Rx : MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.9	7	12.0	5	7	3	-5	-16
2	15.8	2	11.8	-2	3	1	-6	-16
3	18.9	3	14.0	-8	2	3	0	-6
4	23.4	5	17.7	-15	0	5	5	2
5	26.7	5	20.4	-19	-1	5	6	4
6	26.6	5	20.1	-19	-1	4	5	3
7	25.3	5	19.2	-17	0	4	5	2
8	23.4	5	17.8	-11	2	5	4	0
9	20.9	5	15.6	-5	4	5	2	-4
10	18.5	6	14.0	1	6	4	-2	-11
11	16.3	7	12.3	6	6	1	-8	-20
12	14.8	10	11.2	10	6	-1	-14	-30
13	13.9	14	10.5	13	6	-4	-20	-39
14	13.3	18	10.0	17	5	-7	-26	...
15	12.9	23	9.8	20	4	-10	-32	...
16	12.6	26	9.5	20	3	-13	-36	...
17	12.4	27	9.4	21	3	-14	-38	...
18	11.6	29	8.8	18	-2	-22	...	...
19	10.3	30	7.9	12	-12	-35	...	...
20	10.1	30	7.8	10	-14	-38	...	...
21	12.8	28	9.6	23	5	-11	-35	...
22	15.3	26	11.8	29	18	7	-8	-26
23	14.6	20	11.2	20	12	2	-12	-29
24	17.5	15	13.4	16	15	10	1	-10

Tx : VK EAST Rx : USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.0	7	20.4	-9	5	8	8	5
2	25.7	10	20.5	0	10	12	11	7
3	23.9	13	19.2	10	16	16	12	7
4	22.3	17	17.8	20	21	18	12	5
5	21.3	21	16.9	30	26	21	13	3
6	20.6	23	16.3	35	29	22	12	2
7	19.8	25	16.0	36	29	21	10	-1
8	18.7	24	14.5	35	25	16	3	-10
9	16.9	24	12.8	33	21	9	-8	-23
10	15.4	26	11.6	30	16	3	-15	-34
11	14.5	26	10.9	27	12	-2	-21	...
12	13.8	27	10.3	25	9	-6	-27	...
13	13.2	26	9.9	22	6	-9	-31	...
14	12.7	20	9.6	17	3	-12	-33	...
15	12.5	14	9.5	12	0	-12	-32	...
16	11.5	6	8.8	6	-4	-16	-35	...
17	10.1	-5	7.7	0	-9	-22	...	...
16	9.8	-13	7.6	-1	-8	-20	-38	...
19	12.6	-7	9.8	-3	-2	-9	-20	-35
20	17.9	0	13.8	-8	0	0	-5	-13
21	22.6	3	17.4	-14	0	3	2	-2
22	25.1	4	19.2	-17	0	4	4	1
23	25.9	5	19.7	-17	0	4	5	2
24	26.6	5	20.1	-14	1	6	6	4

Tx : VK SOUTH Rx : AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.4	19	7.9	10	-8	-26	...	...
2	10.1	14	7.8	7	-9	-27	...	...
3	13.1	13	9.7	12	3	-8	-24	...
4	18.7	13	14.4	15	13	8	0	-12
5	22.3	9	18.0	9	13	11	5	-2
6	23.6	8	19.0	6	12	11	7	0
7	22.8	8	18.3	5	11	10	5	-2
8	21.3	9	17.0	8	11	9	3	-5
9	19.4	9	15.3	10	11	7	-1	-12
10	17.0	10	13.4	11	9	2	-8	-22
11	14.8	11	11.6	11	5	-3	-18	-35
12	12.8	12	10.0	11	0	-12	-31	...
13	11.5	16	8.9	10	-5	-21	...	...
14	10.8	22	8.3	10	-10	-29	...	...
15	10.4	26	7.9	10	-13	-35	...	...
16	10.2	28	7.7	9	-15	-38	...	...
17	10.0	29	7.7	9	-16	...	...	...
18	9.8	30	7.6	8	-18	...	...	...
19	9.5	30	7.4	5	-22	...	...	...
20	9.1	31	7.1	3	-26	...	...	...
21	9.4	30	7.4	5	-22	...	...	...
22	9.8	31	7.6	8	-17	...	...	...
23	9.3	29	7.3	5	-22	...	...	...
24	9.5	24	7.5	5	-18	...	...	...

Tx : VK SOUTH Rx : SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.7	14	15.6	22	19	13	2	-10
2	21.2	14	15.9	23	20	14	4	-7
3	21.3	15	15.9	24	21	15	5	-7
4	21.1	16	15.8	27	22	15	4	-8
5	19.9	18	15.1	29	22	14	1	-13
6	17.8	22	13.4	33	21	9	-7	-26
7	15.8	25	11.9	30	15	0	-20	...
8	13.9	27	10.5	26	7	-11	-36	...
9	12.2	29	9.2	19	-4	-26	...	...
10	11.0	31	8.2	13	-14	...	...	...
11	10.1	31	7.5	6	-25	...	...	...
12	9.5	32	7.0	1	-33	...	...	...
13	9.1	33	6.7	-2	-39	...	...	...
14	8.9	33	6.6	-4	...	...	...	...
15	8.9	33	6.6	-4	...	...	...	...
16	8.4	34	6.5	-8	...	...	...	...
17	8.2	35	6.3	-10	...	...	...	...
18	8.0	34	6.1	-14	...	...	...	...
19	8.1	32	6.3	-13	...	...	...	...
20	9.7	24	7.6	1	-27	...	...	...
21	12.8	19	9.9	15	-2	-20	...	...
22	16.0	16	12.3	20	10	-1	-18	-37
23	18.5	15	14.1	21	16	7	-5	-21
24	19.8	14	15.0	22	18	11	0	-14

Tx : VK WEST Rx : EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.3	1	10.0	1	2	-2	-12	-23
2	13.7	4	9.6	5	2	-4	-15	-29
3	13.1	8	9.3	8	2	-5	-19	-34
4	12.7	10	9.0	10	2	-7	-22	...
5	12.6	12	9.0	11	2	-8	-23	...
6	13.2	14	9.5	13	5	-5	-20	-37
7	14.5	15	10.5	15	8	0	-13	-27
8	16.3	15	11.8	16	12	5	-5	-17
9	16.9	12	12.9	14	10	3	-7	-20
10	14.7	7	11.4	7	3	-4	-16	-30
11	12.7	0	9.8	2	-2	-10	-23	-39
12	11.4	-7	8.7	-1	-5	-13	-26	...
13	10.6	-14	8.1	-3	-6	-13	-26	...
14	10.2	-20	7.7	-4	-5	-12	-24	-39
15	10.0	-39	7.8	-15	-14	-20	-33	...
16	9.9	...	7.5	-22	-20	-26	-39	...
17	9.8	...	7.5	-28	-25	-31	...	...
18	9.4	...	7.3	-35	-32	-38	...	...
19	8.9	...	7.0	...	-38	...	...	...
20	9.1	...	7.2	-34	-32	...	...	...
21	10.7	-35	8.0	-15	-12	-17	-27	...
22	13.6	-12	10.8	-10	-4	-6	-13	-23
23	15.9	-5	11.2	-10	-2	-2	-7	-15
24	15.0	-3	10.5	-5	0	-2	-9	-19

Tx : VK SOUTH Rx : ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.0	9	16.8	7	12	10	5	-3
2	22.9	9	17.3	6	12	11	6	-1
3	23.3	9	17.6	5	12	11	7	0
4	23.3	9	17.6	5	12	11	7	0
5	23.1	10	17.4	7	13	12	7	0
6	22.5	10	17.0	10	14	12	6	-1
7	21.1	11	16.0	14	15	11	4	-6
8	19.2	14	14.5	20	16	9	-1	-15
9	16.9	18	12.7	25	14	3	-13	-32
10	14.6	21	11.0	22	6	-10	-32	...
11	12.7	22	9.6	15	-6	-28	...	...
12	11.4	23	8.6	8	-19	...	...	...
13	10.7	25	8.0	3	-28	...	...	...
14	10.2	25	7.6	-1	-34	...	...	...
15	10.0	25	7.5	-3	-37	...	...	...
16	10.0	25	7.5	-3	-38	...	...	...
17	10.0	25	7.6	-3	-38	...	...	...
18	9.5	25	7.3	-8	...	...	...	...
19	8.8	26	6.7	-18	...	...	...	...
20	8.8	26	6.8	-17	...	...	...	...
21	10.8	25	8.4	4	-26	...	...	...
22	14.7	12	11.3	13	2	-10	-28	...
23	18.4	10	14.2	12	11	5	-5	-19
24	20.9	10	16.0	10	12	9	2	-7

Tx : VK SOUTH Rx : USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.8	8	20.8	-7	6	9	9	6
2	26.8	10	20.0	3	12	14	12	8
3	25.7	14	19.8	14	19	18	15	9
4	23.8	18	19.0	25	25	22	17	10
5	22.8	20	18.0	32	29	24	16	7
6	21.8	20	16.3	35	29	22	12	1
7	18.9	22	14.2	34	25	16	3	-10
8	16.3	25	12.2	31	19	7	-9	-27
9	14.0	27	10.4	26	11	-4	-24	...
10	12.5	28	9.3	21	3	-14	-38	...
11	11.7	29	8.6	18	-2	-21	...	...
12	11.2	29	8.2	16	-5	-26	...	...
13	11.0	27	8.2	14	-7	-27	...	...
14	11.0	21	8.1	11	-6	-25	...	...
15	11.0	13	8.2	8	-6	-22	...	...
16	10.6	3	8.0	4	-7	-21	...	...
17	9.9	-6	7.5	0	-9	-22	...	...
18	10.0	-12	7.7	-1	-7	-18	-36	...
19	12.1	-8	8.9	-2	-3	-9	-22	-37
20	16.2	-1	12.5	-6	0	-1	-8	-18
21	20.4	3	15.6	-10	1	3	0	-6
22	23.5	4	17.9	-15	0	4	3	0
23	25.1	5	19.0	-15	0	5	5	2
24	26.2	6	19.7	-13	2	7	7	4

Tx : VK WEST Rx : MEDITERANNEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.7	19	11.2	19	10	0	-15	-33
2	14.5	10	10.9	10	6	-2	-15	-31
3	17.4	7	13.7	3	7	3	-4	-14
4	21.7	7	16.5	-2	7	7	4	-1
5	24.3	6	18.9	-7	4	7	5	0
6	24.3	5	18.4	-10	3	6	4	0
7	24.2	5	18.3	-10	2	5	4	0
8	23.7	5	17.9	-10	3	5	4	-1
9	22.5	5	17.0	-7	4	5	2	-3
10	20.6	5	15.6	-1	6	5	0	-7
11	18.2	6	13.7	3	6	3	-5	-15
12	16.0	8	12.1	8	6	-1	-13	-27
13	14.0	11	10.5	11	2	-8	-25	...
14	12.6	15	9.5	12	-1	-16	-38	...
15	11.9	21	8.9	13	-5	-24	...	...
16	11.4	24	8.5	12	-9	-29	...	...
17	11.1	26	8.4	12	-11	-33	...	...
18	11.0	27	8.2	11	-12	-35	...	...
19	10.9	28	8.3	11	-13	-36	...	...
20	10.3	28	7.8	8	-19	...	...	...
21	9.3	29	7.2	1	-30	...	...	...
22	9.3	29	7.2	0	-31	...	...	...
23	11.5	27	8.6	15	-8	-29	...	...
24	13.4	26	10.3	23	8	-7	-28	...

Tx : VK SOUTH Rx : EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	11	10.3	11	8	2	-8	-22
2	14.1	14	9.8	14	8	0	-12	-28
3	13.6	18	9.5	17	8	-1	-17	-34
4	13.1	21	9.2	19	8	-4	-21	...
5	12.9	25	9.2	22	8	-4	-23	...
6	13.6	24	9.7	22	10	-1	-18	-37
7	15.0	23	10.7	24	15	5	-9	-25
8	14.9	17	11.6	18	9	0	-15	-32
9	12.9	12	10.0	11	2	-9	-25	...
10	11.5	5	8.9	5	-3	-14	-31	...
11	10.7	-2	8.3	2	-5	-15	-32	...
12	10.3	-9	7.9	0	-5	-14	-29	...
13	10.1	-14	8.0	-1	-4	-12	-26	...
14	10.0	-24	7.7	-5	-7	-14	-27	...
15	9.9	...	7.6	-14	-14	-21	-35	...
16	9.5	...	7.4	-24	-24	-31	...	...
17	9.0	...	7.1	-34	-33	...	...	...
18	9.3	...	7.3	-34	-32	-39	...	...
19	10.8	-39	8.2	-18	-14	-18	-29	...
20	13.7	-11	10.9	-9	-2	-4	-10	-20
21	17.0	-3	13.1	-11	-1	-1	-5	-12
22	17.4	0	12.2	-9	0	1	-2	-8
23	16.4	2	11.5	-2	3	2	-3	-12
24	15.5	7	10.8	5	6	2	-6	-17

Tx : VK WEST Rx : AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.5	25	7.3	6	-18	...	...	...
2	9.7	16	7.5	7	-13	-33	...	...
3	12.8	14	9.6	12	2	-10	-28	...
4	18.5	12	14.3	14	13	7	-2	-13
5	22.5	10	17.1	10	13	11	5	-2
6	23.8	8	18.1	7	12	11	7	0
7	24.0	8	18.0	5	11	11	7	0
8	23.2	8	17.4	5	11	10	5	-1
9	21.7	8	16.3	6	11	9	3	-5
10	19.7	9	14.7	10	11	7	-1	-11
11	17.1	11	12.8	13	10	3	-8	-22
12	14.8	13	11.1	14	6	-3	-18	-36
13	12.8	17	9.5	14	1	-12	-33	...
14	11.4	22	8.5	13	-4	-23	...	...
15	10.7	26	7.9	12	-9	-30	...	...
16	10.2	29	7.6	11	-13	-36	...	...
17	10.1	30	7.6	10	-14	-38	...	...
18	10.1	31	7.5	10	-15	-39	...	...
19	10.1	31	7.5	10	-15	-39	...	...
20	9.7	32	7.3	8	-18	...	...	...
21	9.1	32	6.9	4	-24	...	...	...
22	9.3	32	7.1	5	-23	...	...	...
23	10.1	31	7.6	11	-14	-38	...	...
24	9.4	32	7.2	6	-20	...	...	...

Tx : VK WEST Rx : SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.3	11	16.4	14	18	15	10	2
2	25.4	11	19.1	14	18	17	12	4
3	26.0	11	20.0	15	19	18	13	6
4	26.0	11	19.5	18	21	19	13	6
5	25.7	13	19.3	22	23	20	14	6
6	23.7	15	17.9	28	25	20	12	3
7	21.1	19	15.9	32	26	18	8	-4
8	18.6	23	14.0	35	24	14	0	-15
9	16.4	25	12.3	32	19	7	-9	-28
10	14.2	28	10.6	28	12	-3	-23	...
11	12.7	30	9.5	24	5	-12	-37	...
12	11.9	31	8.8	21	0	-19	...	...
13	11.4	32	8.4	19	-3	-24	...	...
14	10.9	32	8.0	16	-6	-28	...	...
15	10.7	32	8.0	16	-8	-30	...	...
16	10.7	32	8.0	16	-7	-30	...	...
17	10.0	34	7.7	13	-12	-36	...	...
18	9.9	34	7.5	11	-14	-39	...	...
19	9.7	32	7.4	10	-16	...	...	...
20	9.8	26	7.6	9	-14	-37	...	...
21	11.9	20	8.7	14	-1	-17	...	...
22	15.7	16	12.1	18	11	1	-13	-30
23	19.8	13	15.1	17	16	10	1	-10
24	22.7	12	17.3	15	17	14	7	-1

Tx : VK SOUTH Rx : MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.0	14	12.2	14	11	5	-5	-19
2	15.7	6	11.8	4	6	2	-7	-18
3	19.0	5	14.9	-3	5	5	0	-6
4	23.8	7	18.1	-11	3	7	6	3
5	26.2	5	19.6	-15	1	5	6	3
6	25.9	5	19.4	-17	0	5	5	3
7	25.1	5	18.8	-16	0	4	5	2
8	23.4	5	17.6	-11	2	5	4	0
9	21.2	5	15.9	-7	3	5	1	-4
10	18.5	5	13.9	-1	4	3	-3	-12
11	15.9	5	11.9	3	4	0	-10	-23
12	13.7	7	10.2	7	2	-6	-21	-38
13	12.3	10	9.1	9	-1	-14	-33	...
14	11.5	16	8.5	10	-5	-21	...	...
15	11.0	22	8.1	11	-8	-28	...	...
16	10.8	25	8.0	11	-10	-31	...	...
17	10.8	27	8.0	12	-10	-32	...	...
18	10.8	28	8.1	13	-10	-32	...	...
19	10.4	29	7.9	10	-14	-37	...	...
20	9.8	30	7.5	6	-20	...	...	...
21	9.9	29	7.6	7	-19	...	...	...
22	12.0	28	9.3	18	-2	-21	...	...
23	12.7	26	9.9	21	5	-10	-32	...
24	16.9	19	12.7	23	17	8	-4	-19

Tx : VK WEST Rx : ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.0	12	19.2	14	19	17	13	6
2	25.6	12	19.6	12	17	17	13	7
3	26.2	12	19.9	10	17	17	13	8
4	26.6	12	20.7	10	17	17	14	9
5	26.8	12	20.3	10	17	18	14	9
6	26.8	12	20.4	12	18	18	15	9
7	26.6	13	20.2	15	20	19	16	10
8	25.6	14	19.5	20	22	20	15	8
9	23.7	16	18.1	26	25	20	13	4
10	21.4	18	16.2	33	26	19	8	-4
11	19.2	20	14.6	33	23	13	-1	-16
12	17.1	21	13.0	30	17	4	-13	-33
13	15.6	22	11.8	27	11	-4	-25	...
14	14.7	23	11.1	25	7	-11	-35	...
15	14.0	23	10.6	23	2	-16	...	...
16	13.5	24	10.3	20	-1	-21	...	...
17	13.0	24	9.9	18	-5	-27	...	...
18	12.8	24	9.7	17	-7	-29	...	...
19	11.8	24	9.0	10	-17	...	...	...
20	10.3	25	7.9	-2	-36	...	...	...
21	9.9	25	7.7	-5	...	...	...	...
22	12.8	19	9.7	14	-7	-27	...	...
23	18.2	14	14.1	20	14	6	-7	-22
24	22.8	13	17.6	18	19	16	9	0

Tx : VK WEST Rx : USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.7	6	18.8	-16	0	5	6	3
2	25.3	8	19.4	-10	4	8	9	6
3	23.6	12	18.9	-1	10	12	11	7
4	21.9	14	17.5	7	14	14	11	5
5	20.9	17	16.6	17	19	17	11	4
6	20.1	21	15.9	25	24	19	12	2
7	19.3	24	15.6	31	26	20	11	0
8	18.3	27	14.3	35	27	19	8	-4
9	17.4	28	13.5	35	26	17	4	-9
10	15.9	27	12.0	32	20	8	-7	-25
11	13.7	29	10.3	28	12	-2	-22	...
12	12.3	31	9.1	23	5	-12	-36	...
13	11.5	30	8.5	19	0	-18	...	...
14	11.0	23	8.2	14	-2	-20	...	...
15	10.8	16	8.2	11	-3	-19	...	...
16	10.9	8	8.1	8	-2	-15	-35	...
17	11.0	1	8.2	5	-2	-13	-30	...
18	10.5	-6	8.0	2	-3	-12	-28	...
19	9.8	-15	7.5	0	-3	-12	-28	...
20	9.9	-19	7.7	0	-2	-10	-24	...
21	12.1	-12	9.0	-4	0	-5	-14	-27
22	16.3	-3	12.5	-10	0	0	-4	-12
23	20.4	2	15.7	-16	-1	2	1	-3
24	23.3	4	17.8	-19	-1	3	4	1

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets the passing of:

H	(Harry)	Cuthbert	ex-VK2AEC
TJT	(Tom)	Stroud	VK2AMR
R	(Russell)	King	VK2ARR
LW	(Lay)	Cranch	VK3CF
CJ	(Clive)	Cooke	VK4CC
GA	(George)	Kirkegard	VK4GK
RL	(Robert)	Bridge	VK4NDV
P		Clafton	VK5EH
GF		Massey	VK6GF
JE	(Ted)	Godley	VK6JG

OBITUARY

Thomas Stroud VK2AMR

Tom peacefully passed away on 5 February 1993 after a short illness.

Tom, more formally Thomas James John Stroud, was born 3 May 1905 in the house next door to where he later built his own home, and where he lived for the majority of his life with wife Mary (Mop) and their six children.

Tom left school at the age of 13, and worked with his father as a house painter. In the 1930s, with painting jobs hard to find, Tom answered a newspaper advertisement for a salesman to sell "Esion" radios.

A new interest was born, and Tom soon mastered the repair of radios. His enthusiasm soon spread to amateur radio and, after a lot of reading and experimenting, Tom obtained his amateur licence in 1939.

Tom's other interests ranged from furniture making, including meticulously designed grandfather clocks, to set designing for the Wesley Players Theatrical Group.

My first introduction to Tom was in 1949 when I became interested in AR, and with many others will be forever grateful for the assistance and friendship given by Tom. Tom was an enthusiastic RD contestant and will be sadly missed on the air.

Tom is survived by his six children, 12 grandchildren and seven great-grandchildren.

Sadly missed by all.

Eric Piraner VK1EP

George Allan Kirkegard VK4GK

Many amateurs will be saddened to hear of the passing of George Kirkegard on 18 December 1992 at the age of 71 years.

George served with the RAAF during WWII as a member of 100 Squadron and continued his interest and study into radio for the rest of his life. For a time after the war he worked as a technician with broadcasting stations 4GY Gympie and 4BU Bundaberg. Following this experience he moved to the broadcasting section of the PMG Department, and then into the radio branch as a radio inspector. For many years George was responsible for the interference section of the radio branch, and the final position he held with this organisation before retiring was that of state manager.

George had a special expertise in interference problems, and his ideas were often sought after. He was willing to share his knowledge and expertise with many organisations — including the WIA — as a lecturer.

George moved to Tewantin in his retirement. However, ill health hindered his intention of becoming more active in the hobby of amateur radio.

Our sincere sympathy to his wife Dorothy, daughter Christine, and son Barry.

Les Brennan VK4XJ

Lay Cranch VK3CF

Lay Cranch, widely known throughout Australia as VK3 Charlie Foxtrot, passed away on Tuesday 30 March.

Lay was born in Cairns in October 1910, and came to Melbourne when still a boy.

He studied electrical engineering and was apprenticed to FL Cook & Williams (Ringrip), and became interested in radio as a hobby. He passed his amateur operator's exam at the age of 15, but regulations at the time did not allow the issue of a licence before the age of 18. However, he was given permission to operate with his friend Bill Seivers VK3CB, and they were well known for their operations on 200 metres and other bands. Although denied an amateur licence, Lay was granted an experimental licence which allowed him to operate on any frequency at all, and he held this as VK3T until his passing.

His long career in radio started about 1929 when his boss at Ringrip dismissed him with a month's pay and told him he should look for a job in radio, but that he could have his job back if he failed to get a job in radio. From there on his career reads like a history of the radio industry in Australia. Brashs, Firth Bros, Radio Vision, Essanay, Crown Radio and Kingsley Radio to name some.

During the war years he was at Crown Radio in Sydney, and served in small ships as an officer in the RANVR. He was a member of the Institute of Radio Engineers, the WIA, a foundation member of the Radio Amateurs Old Timers Club, and the Moorabbin & District Radio Club.

He will be greatly missed by his wife Mayzie, his family and countless friends.

Allan Doble VK3AMD
For Radio Amateurs Old Timers Club and Moorabbin & District Radio Club

Ted Godley VK6JG

Ted died suddenly on the 29th March 1993 at Greenough near Geraldton WA.

Ted was a licensed electrician for many years in Bunbury and other country districts. He worked hard in Darwin restoring power after Cyclone Tracy. He was a practical ham, licenced early in post WW2 years and, using fairly basic equipment, worked the world in general and VK6 in particular.

For several years, he travelled around Australia and operated on 14 MHz using a mini beam on top of his caravan, ingeniously lowered or raised as required. A kindly modest operator who gave freely of time and advice, and actively assisted friends into amateur radio.

Over many years he was to be found on forty metres where he is sadly missed.

Deepest sympathy to his wife Win and family.

Lee Hitchins VK6HC
ar

The Origin of "HAMs"

Bill Yates VK3SB

This article originally appeared in "Florida Skip" in 1959, and has been reproduced over the years by other amateur radio clubs.

Have you ever wondered why radio amateurs are called "hams"? Well it goes something like this.

The word "HAM" as applied in 1908 was a station call of the first wireless station operated by some amateurs at the Harvard Radio Club. They were Albert S Hyman, Bob Almy and Poogie Murrary.

At first they called their station "Hyman-Almy-Murrary". Tapping out such a long name in code became tiresome and called for a revision. They changed it to "Hy-Al-Mu", using the first two letters of each of their names.

Early in 1909 some confusion resulted between signals from amateur wireless station "Hyalmu" and a Mexican ship named "Hyalmu". They then decided to use only the first letter of each name, and so the station call became "HAM".

In early pioneer days of unregulated radio, amateur operators picked their own frequency and call letters. Then, as now, some amateurs had better signals than commercial stations.

The resulting interference came to the attention of Congressional Committees in Washington, and Congress gave much time to proposed legislation designed to critically limit amateur radio activity.

In 1922, Albert Hyman chose the controversial "Wireless Regulation Bill" as the topic for his thesis at Harvard. His instructor insisted he send a copy to Senator David I Walsh, a member of one of the committees hearing the bill.

The Senator was so impressed with the thesis he asked Hyman to appear before the committee. Albert Hyman took the stand and described how the little station was built. He almost cried when he told the crowded committee room, that, if the bill went through, they would have to close down the station, because they could not afford the licence fee and all other requirements which the bill imposed on amateur stations.

Congressional debate began on the Wireless Regulation Bill, and the little station "HAM" became the symbol for all the little amateur stations in the country crying to be saved from the menace and greed of the big commercial stations which didn't want them around. The bill finally got to the floor of Congress and every speaker talked about the "... poor little station HAM".

So that's how it all started. You will find the whole story in the Congressional record. National publicity associated the station "HAM" with amateur operators.

ar

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● SHACKLOG V3 the PC logging system. Real time QSO logging, DXCC needs alert, QSL labels, rig control, database analysis, reports etc. Simultaneous packet operation. Optional on-line IOTA database (G3KMA). Plus lots more! 27.50 inc comprehensive manual. Air mail 7.00 SASE for full details to G3PMR, 30 West Street, Gt Gransden, SANDY, SG19 3AU, UK. (Note: Prices are in Pounds Sterling).

FOR SALE ACT

● DRAKE TR7 HF xcvr , gen cov rx, S/N 10431, fan, ext VFO, desk mic, manuals, all filters, ex cond, $950 ONO; Richard VK1RJ (06) 258 1228.

FOR SALE NSW

● ROBOT 400 $380; TELERADER CWR-685A (updated software), $550; additional AMTOR board $100; TNC200 Packet Radio board, $180; SONY ICF-2001 gen cov rx, $240; OLIVETTI M-24 computer, $300; TOM, VK2OE, (046) 21 2228.

● YAESU MUSEN mobile FT7 HF xcvr, mic, manual, $300; PSU 240/13.5 V, $100; both exc cond. Freda VK2SU QTHR (069) 68 1556.

● DECEASED ESTATE of the late Russell King VK2ARR. ICOM IC761 HF xcvr (s/n 03496) with voice freq readout, inbuilt ATU, hand mic, manual, VGC, $3000; KENWOOD TS830S HF xcvr (s/n 1070194 incl remote VFO-230, spare final and driver tubes, cw filter $600; KENWOOD VHF FM xcvr TR-7950 (s/n 3071088) $250; DM81 dip meter, $150; DUMMY load RD 300, $100; AT-200 ATU, $150; MC50 mic $50; SPEAKERS SP-940 $70; SP-930 (new) $100; WELZ PSU RS-3050, $350; DUMMY load CT-15A, $25; DATONG morse tutor D-70, $200; YAESU VHF h/held FT208R, $200; YAESU remote VFO FV107, $150; BENCHER twin-paddle key, $125; DAIWA keyer DK210, $75; CN-520 SWR/PWR meter, $50; AKIGAWA swr/pwr meters APM-IH & APM-IV, $50 ea; Quality home brew ATU, $200; KEYBOARD CW generator, $80. Assorted useful bits & pieces incl LP filters, DOG-BONE tv feeder, roller inductors, variable capacitors, coax, ham text books etc. Enquiries to Kevin VK2DYW QTHR (02) 44 3279.

● DECEASED ESTATE — NALLY 13.7m tilt over tower in GC, HY-GAIN 203BA 20m mono band antenna, HAM 2CD44 rotator and control, $1100, purchaser to remove; enq to Rolly VK2GFO QTHR (044) 74 3361.

● ICOM 2m FM IC28A 5/25 W mobile s/n 15974, $370; AEA PK232MBX multimode controller, s/n 24123, all cables, manuals & software incl, $400; DIAMOND F23A 3 x 5/8 2m vertical antenna, $140; all equipt in vy good cond. Sell the lot for $800. Tony VK2FCO (02) 607 6187.

FOR SALE VIC

● ICOM IC551 6m rig with PBT/Speech proc and FM options, $425 ONO; Chas VK3BRZ (052) 82 3167.

● DECEASED ESTATE of the late VK3BR. Most of this equipment is brand new and unused. ICOM IC-2KL Linear with PSU, $1800; ICOM AT-500 Auto ATU, $500; HEATH Cantenna, 1 kW dummyload, $50; ICOM SM-6 desk mic, $60; ICOM SM-8 desk mic, $100; DRAKE 1 kW low pass filter, $60; JOHNSON Matchbox ATU, exc cond, $200; ICOM RC-10 remote freq cont for IC-751 HF xcvr, $50; ICOM IC-02AT 2m FM HH with spkr mic & BC-36 fast charger, $275; KYORITSU SWR meter, exc cond, $20; QB/300 linear tubes with sockets, $50; DOWKEY coax relays, 2 pos, $25, 3 pos $50; NATIONAL NCX-3 80/40/20 SSB xcvr, 1960s vintage, incl PSU, exc cond, collectors item, $200; PALOMAR antenna noise bridge, $75; BC-221 freq meter, WW2 vintage with AC PSU, all in good order, $25; DATONG woodpecker blanker, $20; REALISTIC AM Stereo BC Tuner, $40; MARCONI 995 A/5 sig gen, covers 1.2 — 220 MHz, good cond, $200; BUTTERNUT HF6V with 160m coil, $200. All the above prices are open to offers. There are also many items not listed. Give me a ring, I might have what you want. Contact Ron, VK3OM QTHR (059) 44 3019.

● REALISTIC HTX100 10m mobile with ZCG mobile antenna, exc cond, $200; Derek (03) 730 1557.

● YAESU HF linear model FL2500, 1 kW, 10m to 160m, updating, 2 spare final tubes, $200-00; VK3WM QTHR (03) 808 2180.

● ICOM IC-751A HF xcvr, S/N 03748, manuals, $1600-00; David VK3DNG QTHR (03) 859 4698

● MODE B SATELLITE EQUIPT; TEN-TEC 1510 Satellite stn, 435/145 MHz; HEPBURN 145 MHz converter; DAIWA UHF LA-4090 UHF lin amp; ZZV SA270 antennae package 145 & 435 crossed Yagis with boom & coax lead-ins; KEMPRO Elev/Azim rotator with KR5400 controller & lead-ins; WELZ SWR/PWR meter SP-420; $1,500 the lot, ONO, or will sell separately ($2500 value); all in mint cond with manuals, ready to go. Alf Chandler VL3LC QTHR (03) 589 5344.

● COLLINS S line equip; 75S3B receiver, 32S3 transmitter incl PSU, exc cond, manuals incl, $1,000-00; COLLINS 390A rx, exc cond, $1,000-00. Rob VK3JE (060) 37 1262 OR (03) 584 5737.

● 420-440 MHz professional built Yagis (two), $120 the pair; 420-440 MHz matched dipoles with phasing harness, $50-00; one pair PHILIPS SXA UHF portables, 470 MHz with desk top charger, $200 00; VK3KFC QTHR Tel (059) 96 3580.

● TOKYO HY-POWER linear HL-2K, 2 kW input, incl WARC bands, pair 3500Z in finals, exc cond, little use with packaging, $2000-00 ONO. Ray VK3CDR QTHR (03) 726 9222.

● SHACK CLEARANCE, YAESU FT227R 2m FM, single memory, rep offsets, 10 W, mic, manual, exc cond, $250; ICOM IC260A 2m all mode mobile, 3 mems, dual VFOs, 10 W, no mobile use, mic, manual, exc cond, $550-00; ALINCO 2m lin amp, model ELH-230G, all mode op, 200 mW to 5 W input for up to 30 W output, ideal for FT290R or any h/held, c/w mounting bracket, manual, exc cond, $120-00; AWA NOISE & Distortion meter model A51932, c/w manual & few spare valves, fair cond, $40-00; DUPONT LABORATORIES Oscillograph model 304H, ideal as stn monitor, vy good cond, c/w spare CRT tube, $50-00. Rob Hailey QTHR (03) 758 1713.

FOR SALE QLD

● TE-13 ROTATABLE multiband dipole, $120-00 ONO, Peter VK4GPS (075) 39 4465.

● YAESU FRG7000 with tuner, $480; NATIONAL DR59 rx, $220; SCANNERS — REALISTIC PRO-2003 $180; BEARCAT 350, best offer. Ron VK4BL QTHR (070) 55 0230.

FOR SALE SA

● YAESU FTDX400 250W HF xcvr, ex cond, recently fitted new Toshiba valves, 2nd owner, orig man, S/N 5053928, $275 neg; VIC 20 computer with CW/RTTY cartridge, used for morse trainer, ideal for higher code speed from 5 to 10 WPM, usual accessories, S/N 149459, $60 ONO; Dean VK5LB, QTHR, (085) 56 9101.

● DECEASED ESTATE — YAESU XCVR FT767GX with books and MD1 mic, pristine cond, S/N 6M070912, offers; contact Bob VK5QJ, 7 Hewitt Av, St Georges 5064, or (08) 379 1845.

● YAESU FL2100Z linear amp, S/N 160061, little use, top cond, $650; EMTRON EAT300 ATU, co-ax, tuned feeders, long wire, $80; Murray VK5BVJ QTHR (087) 38 0000.

FOR SALE WA

● YAESU FT101ZD xcvr, VGC; YAESU FL2100B linear amp, 1200 W, VGC, priced to sell, $900 the lot ONO, will consider splitting $450 each; BOB VK6DH (09) 527 3924.

● INFO TECH RTTY MORSE equipt, comprising keyboard, demodulator, VDU, perf cond, $350-00 the lot. Albert VK6UA QTHR (09) 535 4360.

WANTED NSW

● COLLINS 62S-1 transverter, COLLINS SM-1, SM-2 or MM-1 mic, COLLINS 32-S1 Tx, 516F-2 PSU, BUTTERNUT HF6V vertical, Tom VK2OE, (046) 21 2228 evenings.

● CRYSTALS for 40m band, types FT243, HC6/U, HC33/U, Type D or equiv; Mark VK2EMG QTHR (02) 874 6870.

WANTED VIC

● ANTENNA ROTATOR with controller suitable for a Hy Gain TH3JR beam on a Nally tower. The unit must be in good condition, and be serviceable in Australia. Contact the Kooyong Radio Club Inc, VK3DBN. Phone John (03) 569 1440.

● WANTED URGENTLY by COLLINS collector, 75S3C receiver and 32S-3A transmitter. Must be in A1 cond, pay good price. Rob VK3JE (060) 37 1262.

WANTED VIC

NEW BROADCAST STATION starting June 1993. Volunteers wanted for technical support, including design and maintenance. Stewart Coad (03) 596 8788.

WANTED QLD

● BIRD model 43 wattmeter elements (slugs), any useful "standard elements"; Ron VK4BRG, QTHR (079) 56 1155.

WANTED SA

● CONTEST LOGS suitable for use with Commodore 64, Dick VK5ATU QTHR (08) 258 7020.

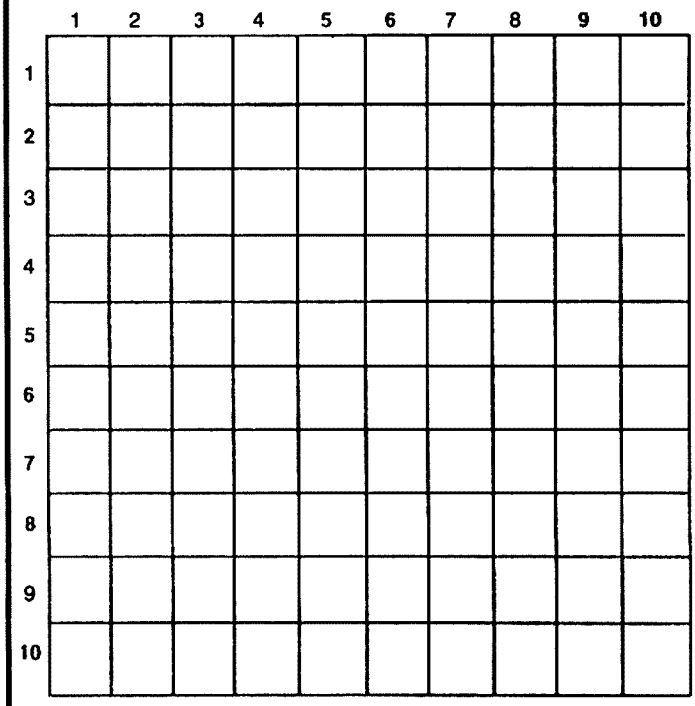
MISCELLANEOUS

● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

ar

Morseword 74

Solution Page 56



Across:
1. Arid
2 Chops
3 Concern
4 Smudge
5 Disguise
6 Spots
7 Achiever
8 Versus
9 Annum
10 Ramble

Down:
1 Arrive
2 Foray
3 Emma's friend
4 Struck
5 Make a knight
6 Green stone
7 Imp
8 Frosts
9 Neat
10 Platform

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members" amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

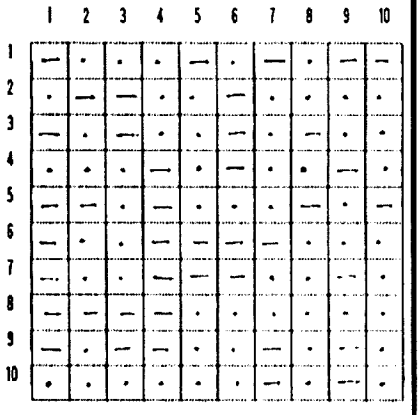
VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

Solution to Morseword No 74

Page 55



Solution to Morseword 74

Across: 1 Dry; 2 Axes; 3 Care; 4 Stain; 5 Mask; 6 Dots; 7 Doer; 8 Odes; 9 Year; 10 Hike.

Down: 1 Come; 2 Raid; 3 Pip; 4 Smote; 5 Dub; 6 Jade; 7 Brat; 8 Ices; 9 Tidy; 10 Dais.

Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

Introductory Price

$399

Cat D-3600

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

IC-765

Our Base Units Have So Many Features, These Pictures Speak Louder Than Words.

IC-781

Our features speak volumes. Rather than write hundreds of words to introduce our range of base units, we'd like you to phone us free on (008) 338 915. We'll provide you with detailed brochures and the name of your nearest authorised Icom dealer.

Alternatively, you can write to Reply Paid 1009 Icom Australia Pty Ltd P.O. Box 1162 Windsor Victoria 3181.

Telephone (03) 529 7582 A.C.N. 006 092 575

L.L. Brown Advertising 3909

AMATEUR RADIO

JUNE 1993
Volume 61 No 6

Journal of the Wireless Institute of Australia

- Spies and Neighbours
- Unwanted Strays — Signals or Noise?
- PK 232 Controller Upgrade

YOU'D EXPECT A WORLD LEADER IN COMPACT COMMUNICATIONS TO HAVE AN IMPRESSIVE TRACK RECORD

New wave technology in every sense - Kenwood is the definitive way to keep in touch when you're at sea.

Pure as the driven snow - that's the sound quality you'll enjoy when you use Kenwood on cross country skiing trips.

Peak performance - thanks to the rugged reliability of Kenwood.

COMPACT TH-78A DUAL BAND TRANCEIVER

The TH-78A (144MHz/430MHz) sets exciting new standards for portable communication combining simplicity of operation with a multiplicity of sophisticated features. It is an innovative Dual Band Tranceiver ergonomically designed to meet the demands of the Amateur Radio world. Alphanumeric memory, multiple scan modes, DTSS and pager functions, dual-frequency receiver and multi-function memory channels are among the features found in this trendsetter.

Peter Brock

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia. TEL: (02) 746 1519 FAX: (02) 746 1509

N.S.W Argent Communications Blacktown (02) 671 3333, DX Engineering Port Maquarie (065) 849 922, Emona Electronics Sydney (02) 211 0988, F&B Amateur Electronics Ballina (066) 867 204, Lake Maquarie Communications Cardiff (049) 567 255, Macalec Pty Ltd Wollongong (042) 291 455, Reg Stockman Communications Inverell (067) 221 303, Action Communications Kingwood (047) 364 797, **A.C.T** Alex Johnson Aranda (06) 251 4920, **QLD** Emona Electronics Stones Corner (07) 394 2555, Mitchell Radio Co Albion (07) 357 6830, **VIC** Bairnsdale Communications Bairnsdale (051) 524 622, Emona Electronics Melbourne (03) 370 0330, Iust Communications Mitcham (03) 873 4142, Measure Tech Supplies Dingly (03) 558 0566, Wecam Wendouree (053) 392 808, Stewart Electronics Components Huntingdale (03) 543 3733, **S.A** International Comms Systems Port Adelaide (08) 473 688, **W.A** Emona Electronics Victoria Park (09) 470 1118, Ford Electronics Osborne Park (09) 242 1766, Leda Electronics St James (09) 361 782, **TAS** Elgin Pty Ltd Launceston (003) 312 711, Elgin Pty Ltd Hobart (002) 344 500.

FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 6 ISSN 0002-6859 June 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
July	7/6/93	9/6/93
August	12/7/93	14/7/93
September	9/8/93	11/8/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover
The neat shack of husband and wife amateur radio operators Judi Fell VK2ELF and Adrian Fell VK2DZF. Over the years, Judi and Adrian have suffered more than their fair share of problems and interference in the orderly establishing of their amateur radio station. Refer to page 6 for the absorbing and humorous story "Spies, Radio Branch and Neighbours".

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

FEDERAL QSP

This is my first contribution to the Editorial column since taking over as Federal President of the WIA following the death of Ron Henderson. I must admit that I approach the job, both the writing and the President's duties, with some trepidation. Ron, and all those who have held the job before him, have provided a very hard act to follow. I hope I can continue the tradition. In developing this editorial I thought I would touch on a subject that I know was of interest to Ron as well as myself — the perceptions that surround the various classes of licences.

In the beginning there was the Full Call and all were considered equal although, with time, the two letter calls became especially sought after by some as though they provided some form of status. Then came the Limited class of licence, matching the Full Call in theory and regulations, but lacking the Morse code requirement. Limited licensees were seen as being VHF and UHF nuts, delving into esoteric theory and practice and playing in areas where many Full Calls feared to tread. Next came the Novice class of licence with a lesser theory and Morse requirement, but the same regulations exam as the existing two licence classes. Finally the Combined Novice and Limited class appeared for those who could handle the higher level of theory but only the slower Morse exams. When (rather than if — I'm an optimist on that front) the new amateur licensing conditions are introduced, there will be a fifth class, the Novice Limited.

Continued page 5

Publisher's Comment

Articles

The WIA is always on the lookout for technical and topical general interest articles from members. However, at present, the supply of articles ready for publication in your magazine is quite low and the need for new articles of all types is greater than it has been for several years.

The rewards for contributing authors? Personal gratification in making a tangible contribution to your hobby by sharing your technical and operating experiences with other members, publication in Australia's own prestigious amateur journal and, in many instances, world wide exposure in overseas amateur magazines.

Please see the August 1992 issue of Amateur Radio magazine, page 18, for information on writing an article for your magazine, or forward a request to Amateur Radio Magazine, PO Box 300, Caulfield South, VIC, 3162 for a copy of that information.

The editors also require photographs (suitable for the cover as well), and small "filler" type items, such as cartoons, hints and kinks, and "Try This".

The WIA needs your help to keep your magazine full of interesting articles. I look forward to a flood of articles.

Bill Roper VK3ARZ
ar

POSITIONS VACANT

(2 positions)

Following the resignation of the General Manager of the Federal Office of the WIA, Council has decided to create two new positions which are now vacant.

Applications are called for the positions of **Secretary** (part time position) and Office Manager (part time or full time position).

Company Secretary The Company Secretary is a non voting member of the Federal Council and is responsible for the smooth and efficient operation of all administrative functions of the Council.

Office Manager The Office Manager is responsible for the efficient operation of the Federal Office in Melbourne, including the management of the staff, examinations service, production of *Amateur Radio* magazine and administrative services to the Divisions.

Salary for both positions will be determined by negotiation.

For further information please contact **Bill** Roper at the Federal Office on 528 5962.

Applications for the positions should be addressed to the

WIA Selection Committee
PO Box 948
Civic Square ACT 2008

Applications will close at 5 pm on Monday 21st June 1993.

The WIA is an equal opportunity employer and all applications will be treated in the strictest confidence.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) $70.00 (G) (S) $56.00 (X) $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Terry Ryeland Bob Lloyd Jones Bob Taylor Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL VK2AOE	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.120, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) $66.75 (G) (S) $53.40 (X) $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) $72.00 (G) (S) $58.00 (X) $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $70.00 (G) (S) $56.00 (X) $42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) $70.00 (G) (S) $56.00 (X) $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) $60.75 (G) (S) $48.60 (X) $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $67.00 (G) (S) $53.65 (X) $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to ***Australian resident*** (F) (G) (X) grades at fee x 3 times.

Late WIA President — an Obituary

The funeral service for Ron Henderson, attended by several hundred people, was held in the chapel at Duntroon Military College in Canberra on 30 April 1993. The immediate past Federal President, Peter Gamble VK3YRP, and the Federal General Manager and Secretary Bill Roper VK3ARZ, attended, together with many local VK1 WIA members. The eulogy was in two parts; the first part being delivered by Brigadier J G Hughes AM, concentrating on Ron's military and scientific career, and the second being presented by Rob Apathy VK1KRA, vice-chairman of the WIA Federal Council.

This is what Rob said:

Ron Henderson was a ham.

Ham is a term used to refer to people whose hobby is amateur radio, and Ron's interest in the hobby goes back a long way.

Ron brought to the hobby of amateur radio his unique brand of all-embracing enthusiasm, meticulously setting the highest examples of technical ability, a warm and gentlemanly manner while talking on air, and a ceaseless dedication of introducing newcomers to the hobby

This is how i came to meet Ron, now almost 20 years ago, as he became my friend and my teacher.

His own interest in radios began at the age of nine or 10 when, following the lead of many young radio experimenters, he built his own simple crystal set.

Little would he have realised that such a simple project would lead to a lifetime passion that was part, not only of his hobby, but his career as well. He gave generously of his considerable natural abilities as an organiser, diplomat, arbitrator and tireless motivator of others, and above all a very good friend to all those whom he met.

His interest in radio drew him to the Wireless Institute of Australia, which he joined at the age of 16 — a full two years before he gained his qualifications in 1954.

Ron's curiosity and interest designing and building his own equipment — some of which still sits in his shack after years of service — continually demanded more than he could find among the demands of career and family. Yet, despite the pace of life he set for himself, Ron directed much of his energy toward the creation of radio clubs, their organisation and enjoyment.

Locally, Ron took an active interest in the early days of the Canberra Radio Society with its weekly meetings and club activities centred on the clubhouse located within the riverside huts at Barton, alongside what was then the Molonglo River.

Time constraints and unavoidable army moves often prevented him from participating in full in many radio activities or contests, but he was quick to encourage others to participate, often lending equipment and advice to those who had the time but lacked the know-how.

Although Ron played an active role in the organisation of numerous radio clubs, he often chose the less prestigious committee positions, leaving the limelight for others while quietly applying himself in background activities.

Ron's gift as a mediator, diplomat and arbitrator earned him a universal respect and, indeed, reverence. Some people are often heard to say in a time of adversity they intend to call in some favours. If Ron had chosen to call in the favours he had done for others he would have been deluged. However, such an action was not his style, nor was it necessary. So strong was the respect of his fellow hobbyists for Ron's own loyalty and sense of service that his role was often that of a silent lobbyist, with people stepping forward at Ron's most subtle behest.

After serving on the local committee of the Wireless Institute in numerous positions, including vice president, alternative federal councillor and federal councillor, it was a natural progression to be appointed to the Federal Executive during 1984.

During his time on the Federal Executive, Ron served as a delegate to the World Administrative Radio Conferences where the long-term future of amateur radio as a hobby is essentially determined.

Ron's talent in coping in this international forum has helped to secure the provision of frequencies and operating privileges for both Australian and international radio amateurs at a time when the commercial pressures have reached breaking point. His work in the field of international frequency allocation has

earned him the highest regard from senior officers and government officials alike.

The past few years have seen the successful restructuring of the Federal Executive of the Wireless Institute, with Ron being an instrumental agent in this mammoth task. He was elected president of the new Executive, meaning essentially that he was chairman of a company representing the interests of 20,000 people within the diverse hobby of amateur radio in Australia.

He was the first president of the WIA to die while holding office.

It is often said that if you need something done, ask a busy man. Ron Henderson was as busy as three men. To contemplate the diversity and magnitude of his involvement in amateur radio is quite beyond the comprehension of even the keenest hobbyist. From his home-built projects to WICEN organisation, from contest operation to the packet group, from work on the international and Federal scene through to housing our beacons — his sense of service was incredible.

At a time when volunteerism is increasingly scarce, Ron Henderson set an impeccable example of dedication to family, service to the community, loyalty to his friends, and a ceaseless demonstration of his love for a hobby by what he could give back.

He was a courageous man and continued with his involvement of Federal matters even during the last periods of his illness. Just a week ago he was preparing papers for the forthcoming Federal Convention.

His courage calls to mind the words of Caesar in Shakespeare's play where he says —

"Cowards die many times before their deaths;
The valiant never taste of death but once.
Of all the wonders that I have yet heard
It seems to me most strange that man should fear;
Seeing that death, a necessary end,
Will come when it will come."

Ham is one term we use in the amateur fraternity — Silent Key is another. It is a term we use when one of our colleagues passes away.

VK1RH is now a Silent Key .....

We say farewell to a mentor, a leader, a teacher, a visionary and, above all, a friend.

Tributes have been received from the IARU and several sister societies.

ar

WIA News

Good Publicity for Amateurs

Northern NSW amateur, Andy Keir VK2AAK, scored widespread publicity for amateur radio in April with a series of articles in regional country newspapers in stories about his contacts with amateurs aboard the Space Shuttle Discovery.

Andy, an ex-Divisional Councillor and keen satellite enthusiast, made contact with the Discovery via both packet and voice. One article, in the Kempsey-based Macleay Argus paper, carried a large picture of Andy in his shack. It pays to publicise!

Amateur Statistics

As at 31 March, there were 18,222 amateur licenses issued in Australia, according to statistics supplied by the DOTC.

Of these, there were 10,634 unrestricted stations, 2633 Novices, 1538 Combined licensees, 3390 Limited and 27 beacons.

Buried in the statistics, we find 334 amateur repeater licenses, which compares well with 427 CB radio service repeater licenses.

FEDERAL QSP

Continued from Page 2

All classes of licence require a degree of hard work and effort on the part of the licensee in order to pass examinations in radio theory, Morse code and regulations. Some are fortunate and pass their exams easily at the first attempt while others find the going hard and may take several attempts to pass. Any person who has trodden the tortuous path to an amateur licence is worthy of recognition for the hard work and effort they have put into being able to pursue this exciting and interesting hobby. Why then is it that we seem to think of some classes of licence as inferior? How often have you heard someone say "I'm only a Novice licensee", or "I'm only a Limited licensee" as if there was something to apologise for? How often have you heard holders of one class of licence speak of holders of other licence classes in a less than complimentary manner?

We are all radio amateurs, have worked hard to get there, and deserve to be accepted for what we are — assets to the Amateur Radio Service! Every Amateur, no matter what his class of licence, has something to contribute to our hobby. The hobby has so many different aspects and people are so diverse in their interests, especially within the amateur radio arena, that there is more than enough room for us all. If our hobby is to survive the increasing world wide pressures on spectrum space, then the more amateurs there are to speak out whenever our hobby is threatened, the better. We should all be seeking to interest more people in the hobby and encouraging them to get an Amateur Licence, no matter what the class, and welcome them to the hobby we all have in common, Amateur Radio.

Remember, we are all Amateurs together and should work in a spirit of co-operation and harmony to further our hobby and common interest of Amateur Radio.

Kevin Olds VK1OK, Federal President

ar

Spies — Radio Branch and Neighbours!

*Adrian Fell VK2DZF * has experienced perhaps more than a fair share of problems in his (and his XYL's) amateur career. Humorous, too!*

Apart from my early boyhood days of crystal sets with cat's whiskers the first recollection regarding the world of radio frequencies was in the 1960s.

I was just starting to get a real interest in hi-fi at that time and was constructing some solid-state and valve amplifiers for my hobby. One beauty that must get a mention was a valve amplifier that didn't use any output speaker transformer; it was directly coupled to the loudspeaker (800 ohms) via a large value electrolytic capacitor. The circuit came from Radio Television and Hobbies, which is now Electronics Australia.

I was married in 1966, and our first home was in Beecroft NSW; this was half a house for which we were paying $25 rent per week. The other half of this house was occupied by the owners.

My workshop was on the floor! All my construction was done there. Any large projects such as loudspeakers were made in my dad's garage at Castle Hill.

I wanted to be a photographer, but became deeply involved with car radios which I stuck at for 26 years. Don't ask me how, but I did. This is where it all started for me and, despite the purchase of a brand new communications receiver from AWA (CR-6A), I developed no interest for amateur radio until the late 1970s.

The technician for all our repairs was Ivan Huser, who was an amateur radio operator. His friend Barry Wood, who was a rep for our electronic parts, was also an amateur radio operator. I was surrounded by fanatics; I eventually would have to submit! Actually I owe a lot of inspiration to these great men.

Troubles

At one brief stage during my radio stint I decided to build a radio-controlled boat which, of course, required a transmitter. This was step 1, so I finally picked a circuit from an English magazine. The circuit didn't use a crystal and, from memory, it worked in the 27 MHz band. A small receiver was built to suit, and two tone-controlled amplifiers to steer the boat left or right.

The next stage was to test the range of the set-up; this is where my wife got her first taste of being married to a radio fanatic. I decided — well, we both did — that Judi would put the transmitter in an ice-cream container along with a battery. She then could go on long walks around the Beecroft streets. I stayed at home with the receiver where I could monitor the transmissions, dry and cosy.

We worked out some keying codes, consisting of dots and dashes (not Morse) that told me where she was at any stage of the walking trip. That way I knew how much range this little transmitter had.

"..... around this period of 1967, there was a lot of hype in the media about SPIES!"

It was transmitting all right; so well, in fact, that every television set for kilometres was getting massive interference from our tests!

We were oblivious to all this interference and, around this period of 1967, there was a lot of hype in the media about SPIES!

Somebody notified Radio Branch, which came out in force looking for the source of these transmissions. We were unaware of all the fuss! Our testing continued day after day, week after week; this was fun.

One day I got a brainwave and decided to reverse the procedure (yes, I still stayed at home) giving Judi the receiver (it was small enough for her walks. The transmitter was connected to my "out of sight" 100ft (30m) receiver aerial. You can imagine the interference then!

Radio Branch now had a fixed transmission to look for, and eventually came running into our property and banged on the front door. We were very lucky, as our entrance was on the side of the house, and they didn't realise this. All the commotion we heard made us realise it was US they were looking for. Talk about a close shave! Maybe a radio-controlled boat wasn't such a good idea after all.

Did Radio Branch get its revenge many years later? I think so. Read on.

Grown-up problems

Some six years later we moved to Baulkham Hills where we purchased our first house. This was now a place to call home, with our own land, FOR ANTENNAS. I eventually obtained my novice call VK2VLF, and my wife followed with VK2VUF. We both then got the AOCP a little time later.

My main interest was experimentation with antennas, and I tried all the popular varieties. Judi again would often do a lot of on-air testing for me. Eventually I obtained a 65ft (20m) wind-up tower from my friend Ivan, who was now a VK5. I swapped some ATU parts etc for it. The tower arrived from SA, but the freight cost me nothing as there was a mix-up with paper-work. Wow! On this tower I put a HyGain duo-bander. With all my wire antennas off it as well, this was great. Dreamtime stuff, we thought.

Well, we may have thought it was great, but our next-door neighbour did not, so the complaints started coming, and coming. It finally got to the stage where we stopped talking altogether. Then the gossip started in our street about the TVI complaints. It just kept snowballing; we got blamed for everything! Since our tower was in the air, the storms were now attracted to our street! This was getting to paranoia levels. What made it worse was our house was in a cul-de-sac; boy, is that bad news?

18 visits by Radio Branch

There was a quiet period when all seemed to be getting back to normal. Then one day there was a knock on the door: "This is Radio Branch and

Husband and wife ham team, Adrian VK2DZF and Judi VK2VUF/ VK2ELF at their rig.

we want to inspect your equipment." They were angry! Why? Because the neighbours next door said we were SPIES using CB radios.

Can you imagine the stress my wife had to cope with? I was at work at the time.

When RB realised we were a licensed amateur station they calmed down somewhat. But, as this was a complaint, they had to follow it up.

The real reason for our neighbours" complaint was they just wanted to get rid of all those antennas; and us, I guess!

This was only the beginning. The next visit from Radio Branch was for TVI complaints from — yes — the same neighbour. This didn't work either, as our station was clean. But there was some TVI, we got the neighbour some high-pass filters (at our cost) for their many, many TV sets. They had splitters everywhere, and the aerial was one of those stacked dipole arrays.

This harassment continued for ages. In total we had 18 raids from Radio Branch. This finally stopped when we wrote to Radio Branch forbidding them entry to our house. This was at the inspector's suggestion. Radio Branch was being driven mad by these people, along with us, and we even thought of suing "everybody" for harassment. Why we didn't I just don't know.

After that, all went quiet for a while. Wait for it ... !

Council Orders Our Tower Removal

It seemed these people (if I can call them that) decided that if they could not get us via Radio Branch then the local council was the next line of attack.

From memory, we applied twice to install the tower, but I can't remember if that was before or after we put it up. I was determined it was going up, no matter what, so I really didn't care about council. Then came the next war for us; a paper war that lasted another 18 months or so, with our council. Our neighbour used to smirk at us when this was going on; boy did I think some terrible thoughts about revenge.

Finally the letter came from council's solicitor. You have X amount of days to remove the tower, or else! Now, just to complicate things a bit more, council's solicitor was also ours, for many long years. This was a messy affair, but I knew council had erred with its paperwork, so I was going to fight to the end.

We obeyed council's request, and removed the tower, where it lay sadly on the ground, hopefully to fight another day.

I was very determined and confident we could beat council, along with our neighbours, so I called for help with the Land and Environment Court. An on-site inspection was arranged between council, council's solicitor and myself; that is, after all the required paperwork was done.

Guess what? The LaEC inspector was an amateur radio operator, and he informed both council and their solicitor that if it went to court they would lose. We could now re-install our tower and antennas. YIPPEE! WE WON! Guess who was smiling at our neighbours now with BIG smirks.

The things we have to go through to get an antenna in the air so we can enjoy our hobby are at times beyond my comprehension.

We finally pack up and move

As the years passed the family grew to four children, and our house was just not big enough. You can imagine the faces when the For Sale sign went up. Luckily we sold fairly quickly, and moved to Castle Hill where we purchased a brand new house. This had to be turfed. I laid out 500m of ground radials first, before Judi and I turfed the back yard.

We were still in the same shire, so had the same council. And, as we would have had to re-apply for the tower, along with the fact that this was a new subdivision, led me to sell the tower and beam.

This is why I have decided to stick with low visibility wire antennas, and I really don't miss the big YAGI, although my wife still does.

Problems with transceivers

The very first amateur radio HF transceiver I got my hands around was the Yaesu FT 101B. Others I had seen were the FT200 and FTDX 400. Although these rigs were good, I decided to purchase a brand-new Kenwood TS 520S. This rig did a

great job for 13 years until it finally went up in smoke.

I bet all you Yaesu fanatics are saying, "Now! That will teach you." But it really wasn't the 520S' fault because I added a bit. Let me explain.

The final stage developed an intermittent fault that caused the cathode resistor to blow open circuit during transmission. This could happen once a day or a week, or even months apart, and I could never find out why. Although I suspected the valves (6146B), everything was checked and checked, to no avail. It was very frustrating, as it happened only in the middle of a QSO, then BANG! everything went dead. Some way to end a QSO! It was very embarrassing!

One sunny day, in the middle of a QSO, it went bang; I was getting very used to the routine of resistor changes, but this particular time I had used all the correct value resistors. With such experience I became very quick to do the repair, and often I could get back on air and apologise to the other party. This time, however, I had to improvise, so I parallelled up some available resistors to obtain the correct value. I was back on the air, but missed the station I was in QSO with.

"It was very frustrating, as it happened only in the middle of a QSO, then BANG! everything went dead."

Some days, or weeks, later I was in another QSO when this fault appeared again. This time there wasn't any bang, rather a great rush of toxic smoke came pouring out of the 520S, then flames!!

I grabbed the fire extinguisher; it didn't work! I ran into the bathroom, came back with a container of water and threw it all over the rig.

By this time the shack (in the house) was filling with this toxic smoke, and I started to gasp for air. This was getting very serious.

I had pulled out the power plug. The smoke was so bad I had no other option but to get out of the house. I ended up in the back yard looking up, gasping for fresh air, and praying the fire was out. I was lucky. It was!

It was some months before the toxic fume smell left the house, and all our clothes required washing many times. Amateur radio wasn't very popular in our household at that stage.

It was time to get a new transceiver. So, until I made up my mind what I wanted, I purchased a used FT 101 ZD MKII, which a local friend of mine finally bought. After much deliberation I decided on the little ICOM 735, which really does an excellent job.

So there it is, amateur radio in all its glory; the ups and the downs; the stress and the joy; but I still love it! How about you?

Did I have a nervous breakdown? Well, actually I did, in 1990. I wonder if all this drama played its part?

* *PO Box 344 Baulkham Hills 2153*

ar

Upgrades for the PK-232 Multi-Mode Data Controller

*Colin MacKinnon VK2DYM * is impressed with a popular data controller, and now provides excellent detail about its operation, and upgrades.*

The AEA PK-232 Multi-mode Data Controller has been around for a number of years, with over 50,000 in use worldwide, and it is still equal to or better in performance than other similar units.

There have been several hardware and software changes to keep it up to date and the current model is called the PK-232MBX, because it includes a mailbox facility. However, owners of older models can upgrade their units to current specifications, so if you have an earlier version you might like to know what is available and how easily the PK-232 can be upgraded. The prices I have shown are in US Dollars, except where noted.

1. MBX (Pakmail) Daughter Board with new Firmware. Price US$ 85.00 including air parcel post from USA.

The original PK-232 can be upgraded to the latest MBX (mailbox) model by fitting this kit which consists of a daughter board to go inside the case, with new software in ROM. AEA calls the ROM "firmware". The installation is well documented in the instructions supplied and requires you to remove the existing, now obsolete, ROM and RAM chips and fit the new daughter board such that two 28 pin plugs underneath it insert into the vacant ROM sockets on the main PC board. Two new RAM and ROM chips are inserted on the daughter board and one wire is soldered to a resistor on the main board. The whole upgrade only takes about 15 minutes.

The Pakmail or mailbox facility allows the PK-232 to act just like a mini-BBS, with similar commands and features. It is limited to a maximum of 18,000 characters in the messages area, but that should satisfy most users. Rather than use your existing MYcall, eg VK2DYM, you can set a MYMail call for your mailbox, eg VK2DYM-1, and then others can connect to it independently to leave messages for you or for others, receive messages and read messages. You act as the Sysop for your MBX. The firmware supplied with this daughter board kit is the latest version and is described below.

2. MBX Firmware for existing PK-232MBX models. Price US$ 49.95 including air parcel post.

> *"The original PK-232 can be upgraded to the latest MBX . . ."*

Over the period since the PK-232 was introduced there have been several ROM changes, with the latest in August, 1991 when AEA released new Firmware for the MBX. If you have an earlier PK-232MBX that has not been upgraded, this August 1991 release will provide you with all the new and improved features and introduces extra commands for the HF enthusiast. It allows Pakmail on Amtor as well as Packet, "Paklite" — a reduced overhead form of the AX.25 packet protocol which should give a faster data throughput on HF packet operation, and SAMPLE and XBAUD commands for analysis of unknown signals and operation on non-standard RTTY baud rates. Installation of the new firmware is simply a matter of replacing the ROM IC with the new one supplied. On the start up screen you will now see "RELEASE 01.AUG.91" to indicate the latest firmware version.

3. PC-Pakratt II Version 5.1 software upgrade. Price, when ordered with MBX firmware US$ 59.95 incl postage. Price, when ordered with firmware and the MBX daughter board US$ 95.00 incl postage. Price, when ordered alone, approx US$ 15.00 including postage.

The IBM (tm) compatible software upgrade released in August 1991 is supplied as two 13cm disks as well as one 9cm disk. You must return your original disks, the ones with the AEA serial number, to obtain the updates, and it is usual to buy the MBX firmware and if needed, the daughter board, to get the full benefit of this upgrade. There have been a number of enhancements since Version 4.0 of PC-Pakratt II, the most significant of which are a built in text editor, a binary file transfer to packet which is compatible with YAPP, and support for the new firmware commands. There are new, comprehensive manuals and a disk for AEA PC-FAX is part of the package. Incidentally, AEA states that if you bought your PK-232MBX or the PC-Pakratt II program on or after June 22, 1991 you are eligible to receive this upgrade of August 1991 for $US 5.00, providing you send a copy of your receipt and the original disks. No doubt your local retailer provides this service too.

4. PK-232MBX Manual. Price US$ 25.00 plus US$ 20 air parcel postage.

The original PK-232 manual was a bound book with a white cover and red illustration. The disadvantage has been that as amendments were issued they could not be inserted in the book, and page numbers became out of sequence. AEA has now published a loose leaf manual, with all current amendments and provision for inserting any future updates. This 3-ring binder manual has been supplied with new machines since January 1991.

5. Lithium Battery back up. Price — included with the MBX daughter board upgrade.

Earlier PK-232's had three AA batteries in a holder attached to the underside of the lid. Later models have a small lithium battery on the main PC board. The MBX daughter board kit includes this battery too.

All of the above are available direct from AEA in the USA and no doubt can be obtained from local retailers. You should quote the serial number of your machine and the release date of the firmware as shown on the start-up screen when making any enquiries. I don't have any information on software upgrades for MacRATT for Macintosh, or Com-Pakratt for the Commodore 64 computer, but AEA has an Upgrade Hot Line phone number and also

provides technical support through the Compuserve phone BBS. I would expect that the dealer from whom you purchased your unit would provide you with all the details of any developments.

6. 2400 Baud Modem. Price — AEA version US$ 130.00 plus approx US$ 20.00 air parcel post. Price — MFJ version US$ 69.95 plus approx US$ 15.00 air parcel post.

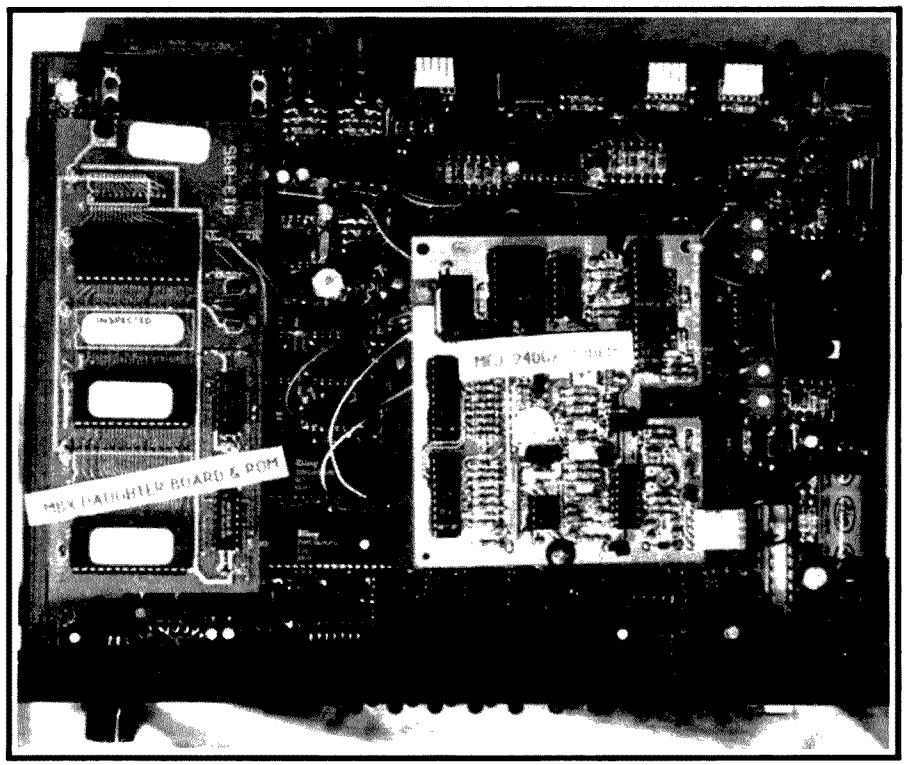
Contrary to what another, ill-informed, writer claimed, AEA does offer a 2400 baud modem for the PK-232. However, they prefer to fit it at their factory so you would have to ship your unit over to them. This is the more expensive option, but at least by keeping your PK-232 with all AEA components you won't have any warranty problems.

A while ago, MFJ in conjunction with Buck Rogers, K4ABT (I swear that really is his name !), developed a user installed version of the MFJ-2400 baud modem, especially for the PK-232 and PK-232MBX. It is designated the MFJ-2400X and differs from the standard model in that it has connecting wires instead of a 20 pin header plug. Installation in the PK-232 is a simple job, requiring soldering 12 colour coded wires to the PK-232 mother board, and bolting the PC board into the PK-232 using an existing pillar and nut.

A comprehensive instruction manual is provided and the whole job takes about 30 minutes. The first K4ABT design required you to fit a small change-over switch to the PK-232 case, but if you have the latest firmware and the MBX board, there is a command — ALTModem 0 or ALTModem 1 — which switches between the 1200 baud and 2400 baud modems via software, a much neater little trick. To change to 2400 Bd you type in ALTM 1 to switch to the faster modem, and HB 2400 to change the transmission speed.

7. 9600 Baud Modem. Price — MFJ version — US$ 109.95 plus postage.

AEA does not support modems above 2400 Bd for the PK-232 but MFJ makes the MFJ-9600 modem which is identical in dimensions to their 2400 Bd unit so therefore it will fit in the PK-232. It is only sold with the standard 20 pin header plug so you would have to remove that and add wires to duplicate the 2400 Bd connections. The PK-232 has a 9600 Bd rate so will function quite OK at this speed, but note that almost all transceivers need modifications to work at 9600 Bd. Note too that you cannot fit both the 2400 Bd and 9600 Bd modems at the same time, at least not without some difficulty. You could conceivably connect the extra modem as an external unit to the PK-232 if you know how to wire it up.



Upgraded PK-232 showing MBX daughter board on left, and added 2400 baud modem in centre. Photo by Colin VK2DYM.

"You could conceivably connect the extra modem as an external unit to the PK-232 . . ."

8. Pre-wired Radio Interface Cables. Price US$ 25.00. (13 pin Kenwood ACC2 costs US$ 30.00).

AEA can supply pre-wired cables to connect your PK-232 to a range of transceivers such as Kenwood, Icom, Yaesu and Alinco. This may not be of much interest to existing PK-232 owners who had to solder up their own connections, but is worthwhile for new purchasers to save time and reduce wiring errors.

As mentioned above, AEA sells direct from the USA and provides fast and helpful service. MFJ only sells via dealers and in this age of electronic funds transfer and Fax machines you may find it of advantage to contact a reputable US retailer, and quote your Visa or Mastercard number. Cheques in US dollars are acceptable of course but your friendly bank will charge you at least A$8.00 just to type out a bank cheque for you. Delivery ex USA is usually within 14 days and you may find it possible to obtain anywhere from 10% to 30% discount on list price from some US outlets. The total cost in Australian dollars is about 1.5 times the US price, which takes into account the exchange rate of about $A 0.75 = US$ 1.00, plus our 20% sales tax. Of course local retailers can also help you with all these products, although I notice that some advertise but do not carry stocks and wait until they have a number of orders before contacting their US supplier.

9. TAPR Modem Disconnect Header. Price US$ 20.00 plus postage.

The Tucson Amateur Packet Radio (TAPR) corporation, a non-profit group, designed some of the very first amateur packet controllers. They included in their TNCs a 20 pin

socket or Modem Disconnect Header which has become an industry standard. However earlier PK-232 units did not have this socket and the latest models have a non-standard 7 pin socket. To allow you to install other brands of modems and various accessories you can build a small PC board from a kit which fits inside the PK-232 and provides this 20 pin Disconnect Header. If you had this kit fitted you could just plug in the standard MFJ-2400 or MFJ-9600 Bd modems, or indeed other products, with no extra wiring needed.

10. State Machine DCD Upgrade. Price US$ 15.00 plus postage.

What the heck is that? Well most TNCs do not have very effective DCD (Data Carrier Detect) so they don't always detect the presence of another signal and transmit over the top of it, or they detect noise as a signal. Either way the result is reject packets and a slowing down of data transfer, particularly in busy regions. At the moment the AX.25 level 2 protocol compounds the problem but proposed changes to become AX.25 level 2, version 2.1 will help. Modems with the 7910 chip are particularly prone to this DCD problem (because the 7910 is basically a telephone modem design) and even those TNC's with alternative demodulator designs which detect a change of state of a valid data signal, hence "state machine", can benefit from an improved DCD.

TAPR supplies an Eprom based DCD kit which mounts inside the PK-232 and derives correct DCD action by lock up of a phase locked loop. It improves DCD operation (TAPR say dramatically) allowing you to run your transceiver unsquelched, for better sensitivity, and with faster TXDelay.

This same kit will fit many other TNCs with a state machine circuit and TAPR has another version for US$ 15.00 to fit those TNC's with the XR2211 demodulator IC.

The most benefit occurs when all stations in the area have decent DCD so that they all detect others' data signals and defer transmissions till the channel is clear, rather than clashing.

TAPR also sells a range of packet related kits and software and accepts cheques in US dollars or Visa and Mastercard only.

11. Dallas Smartsocket. Price approx A$19.00 in Australia.

If you happen to be running a computer control program that does not load a real time clock or loses it when you shut down, you can fit this clock chip-in-a-socket under the existing RAM chip in your PK-232 (and other TNCs). Then you can log the times of all stations heard etc, and don't have to set the PK-232 clock each time you switch it on. The version of Smartsocket for the 62256 ROM used in the PK-232MBX and upgraded PK-232's is the DS1213C from Veltek in Sydney or Melbourne. Other versions of the Dallas Smartsocket may be necessary for different ROM chips.

* *52 Mills Road, Glenhaven NSW 2156*

ar

WIA News

Amateur Radio in Trans-Continental Balloon Crossing

Amateur radio will be playing a very public role on adventurer/publisher Dick Smith's Australian Geographic Trans-Continental Balloon Attempt, scheduled to fly as this month's magazine is posted (Monday, 31 May).

Dick, VK2DIK, is carrying his HF amateur rig in the gondola slung beneath the balloon, which also houses a host of high-tech satellite navigation and communications equipment.

Another amateur station, comprising Yaesu equipment supplied by Dick Smith Electronics, is set up at Australian Geographic's Terrey Hills, Sydney, headquarters. Using the special event callsign of VI2AUS, it will act as "net control" for contacts between VK2DIK aboard the balloon gondola and amateurs around Australia and world-wide, as well as a backup communications centre. Look for them around 14,140-14,150 kHz, as well as the lower bands. Give them a shout!

In addition, VI2AUS will publicise the event, looking for contacts. A special QSL card is to be issued for all confirmed contacts and SWL reports.

NSW Division Special Projects Officer and "How's DX" columnist, Stephen Pall VK2PS, is coordinating operators for VI2AUS operations.

Type Approval Not Required

Amateur equipment will be exempt from type approval under the new standards and compliance framework of the Radiocommunications Act 1992, according to advice received from Roger Smith, First Assistant Secretary of DOTC's Radiocommunication Division.

Mr Smith conveyed the good news in a letter dated 15 April, which followed up on a meeting between him and David Wardlaw VK3ADW on 24 February and a confirming letter from WIA General Manager and Secretary, Bill Roper VK3ARZ on 16 March.

In his letter, Roger Smith said, "This exclusion has been made because of the experimental nature of the activity pursued by radio amateurs. It is also consistent with the approach taken in other countries, such as Europe.

"We will request that Standards Australia make generic standards covering all radiocommunications equipment. These generic standards will be based on international standards (where they exist).

"Amateur radio equipment would be required to conform to the requirements of mandatory generic standards.

"The WIA has been invited to participate in the relevant Standards Australia committee to ensure that it is able to represent the needs of Amateur users."

Unwanted Coupling of Stray Signal or Noise —

*Lloyd Butler VK5BR * examines some effects and remedies of undesirable noise and instability.*

Most of us who have assembled electronic equipment have experienced unwanted coupling of noise into our circuits or instability because of coupling between circuit stages or modules. An elementary understanding of how this coupling occurs and how it can be reduced can save a few headaches. With this in mind we will discuss relevant topics such as induction into cable and lines, common mode currents and coupling due to common earth or power rail impedance.

Coupling into Cables or Transmission Lines

Signals can be coupled into cables or lines from both stray electric fields and stray magnetic fields. Most vulnerable are low-level audio lines such as those connected to microphones and antenna lines connected to radio receivers. Microphone lines are particularly prone to induction of audio frequency noise from power wiring and other stray fields. They can also pick up higher frequency fields which are generated by nearby radio transmitters. In this case, the RF signal is often rectified in the audio amplifiers to be detected as audio frequency interference, or the amplifiers are overloaded by the signal and saturate. If the microphone is connected to the transmitter generating the RF signal, the system can become unstable. This is often experienced in the amateur radio station as distorted audio or severe oscillation on the modulated signal.

Localised noise fields caused by noisy power lines and noisy electrical appliances are usually greatest in the vicinity of power wiring which conducts the noise signal. For the radio receiver, this source of noise induction can usually be reduced by ensuring that RF signal pick-up is confined to the antenna proper, with minimal pick-up in the feeder cable. Hopefully, the antenna proper will be distanced from the power wiring.

We now turn our attention to the line circuit impedance. Figure 1 shows an interesting circuit coupled via stray capacitance into our cable or line signal circuit. The source impedance and the load impedance of our signal circuit are both equal to a resistance value R. For a given signal power level, the signal voltage at the load is proportional to the square root of the value of R. On the other hand, assuming the reactance of the stray capacitance is large compared to R, the noise voltage across the load R is almost directly proportional to the value of R. Comparing these relationships, we can resolve that, for capacitively coupled noise (the electric component), the ratio of noise voltage to signal voltage is lowest when the circuit impedance is lowest.

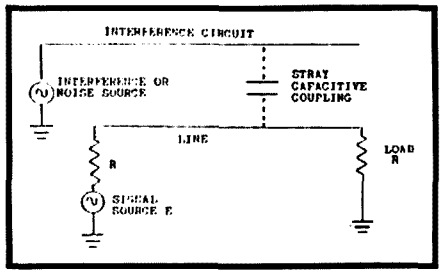


Figure 1 — Coupling via stray capacitance (The electric field)

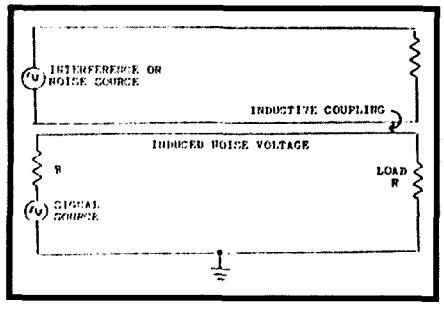


Figure 2 — Coupling via magnetic induction (The magnetic field)

We now discuss coupling of the interference signal via the magnetic field. In Figure 2, one leg of our signal circuit is inductively coupled to our interference or noise source by its proximity to one leg of the noise source so that a noise voltage is induced in series with our signal circuit.

For a given signal power level, the signal current in the load resistance R is proportional to the square root of the reciprocal of R. If we assume a fixed noise voltage induced into the active leg of the signal circuit, the noise current in R is directly proportional to the reciprocal of R. The voltages across R are proportional to the currents through it and, comparing the preceding relationships, we can conclude that for inductively coupled noise (the magnetic field) the ratio of noise voltage to signal voltage is lowest when the circuit impedance is highest. This is opposite of that for the electric field and, hence, in a given line circuit, there can be an optimum value of circuit impedance which gives the best overall signal to noise ratio, considering both types of field.

Shieldings

Coupling from an electric noise field can be minimised by electrostatic shielding. For wiring, the active lead or leads are clad with a metallic braided sheath. It is normally necessary to run low-level lines, such as those from microphones, in this shielded wire. Figure 3A shows a shielded microphone line with the shield earthed at its two ends at different points in a building. The problem here is that noise voltage exists between the two earth points. If you want proof that such potentials exist, just connect an AC voltmeter between water taps in different rooms of a building, or between two earth stakes at different locations. Quite sizeable AC voltage can usually be detected, developed from stray earth currents. Referring again to Figure 3A, the potential between the two earth points causes noise current flow in the shield with voltage developed across the series resistance and inductive reactance of the shield. This noise voltage is in series with the microphone circuit and is added to the microphone signal voltage. The golden rule is to only connect one

earth at the amplifier end of the shield, as shown in Figure 3B, so that the noise current cannot flow from the earth system.

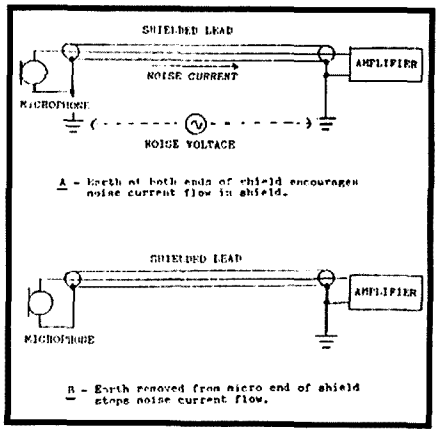


Figure 3 — Earthing of microphone cable shield

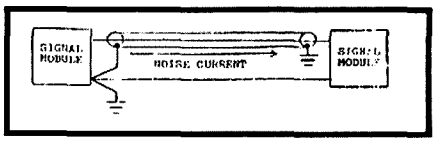


Figure 4 — In this arrangement, noise is magnetically coupled into the signal wire from noise current in the shield

Another undesirable connection is shown in Figure 4 where two signal modules are connected by a shielded wire. The modules are both earthed at the one point, but one end of the shield is connected to a different earth location. In this case, the noise voltage developed along the shield is no longer in series with the signal circuit, but is coupled into the signal circuit by magnetic induction. To correct this problem, the right-hand shield connection should either be taken out or, instead, connected to the second module common. At radio frequencies, where coaxial lines connect matched circuits, the second option obviously has to be used.

The same principle of single and earthing applies to antenna feed lines. Where an antenna is mounted on a metal tower and fed with coaxial cable, the outer conductor of the cable is by necessity normally connected to the antenna structure. This, in turn, is fitted to the tower and also electrically connected. If the antenna structure can be electrically insulated from the tower, the outer shield of the coax cable feeder will be more effective as a noise shield. Unfortunately, most of our antenna hardware does not allow us easily to do this.

Balanced Lines

So far we have considered noise induced into unbalanced lines which have one active wire and an earth return line. Where signals must be transmitted some distance, or where coupling between adjacent line circuits must be reduced, balanced wire pairs are used. Circuits connected to the lines are balanced against ground, and the wire pairs are twisted or regularly transposed in some way so that any external electric or magnetic field induces equal currents into the two conductors. Figure 5 shows a balanced line coupled at each end to equipment via a transformer winding which is centre tapped. If the centre taps at both ends are earthed or connected to some other common bus, the induced interference currents (In) flow via the common connection. These are called longitudinal or common mode currents. While the signal current (Is) induces a voltage in the secondary winding of the transformer, the induced interference currents in the two wire legs create equal and opposing magnetic fields in the transformer and induction into the transformer secondary is cancelled.

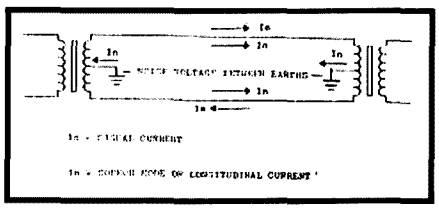


Figure 5 — Balanced line showing common mode noise current

Of course, balanced circuits are not always well balanced so that the opposing fields do not completely balance, and some interference or noise signal is induced into the secondary. This can be reduced by leaving one or both centre taps floating so that a return path for the common mode circuit is blocked, preventing current flow. This also prevents noise current flow resulting from noise voltage existent between the two earths as discussed in previous paragraphs.

For many low-level circuits, such as microphone lines, the circuit is both balanced and shielded. In this case, the cable shield and the centre tap are both floated at the microphone with earthing only at the end facing the amplifier. The case of the microphone, which shields the microphone insert, is connected to the cable shield.

For the low-level microphone line, a low impedance is chosen to minimise noise induction from electric fields, but not so low that the line is more affected by magnetic fields. A modern broadcast station standard is a 200 ohm microphone source impedance operating into a 600 ohm load. (An earlier standard was 50 ohms operating into around 150 ohms load).

Sometimes we make use of the common mode or longitudinal path in our balanced lines to operate a control or switching circuit. In the days when open wire lines were used for trunkline telephone systems, telegraphs were operated over the common circuits. This type of circuit was called a cailho circuit. Two cailho circuits over two balanced lines were also often used to make a third balanced circuit for voice frequency operation, and this was called a phantom circuit. To go one further, the phantom circuit was centre tapped to form a cailho over which telegraph could be used. The arrangement is shown in Figure 6. Balanced circuits, such as these, which operate at audio power levels of around one milliwatt (0dBm) achieve crosstalk and noise levels satisfactory for speech communication.

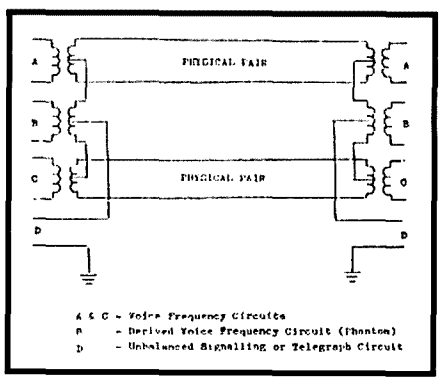


Figure 6 — Making use of common mode circuits to derive further circuits (Cailho and Phantom Circuits)

Of course, leakage to earth can occur on these balanced lines when

there is a faulty insulator on an open wire pair, or when water gets into a cable carrying the line pairs. This causes an imbalance in the line, inviting induction from external noise fields of crosstalk from other adjacent open wire circuits or cable pairs. This is often what has happened when our telephone lines get noisy.

Balanced RF Circuits

Common mode currents in balanced circuits operating at radio frequencies can be effectively blocked by using a balanced choke of adequate inductance (refer Figure 7). The choke, wound on a ferromagnetic core, is bifilar wound to produce high magnetic coupling between the two windings. The common mode currents (In) are in phase through the choke windings and are impeded by the choke's inductive reactance. On the other hand, the signal currents (Is) through the two windings are in antiphase and the magnetic fields produced from these cancel so that they see zero inductance (at least in theory). Hence, the signal is allowed to pass while the common mode current is opposed.

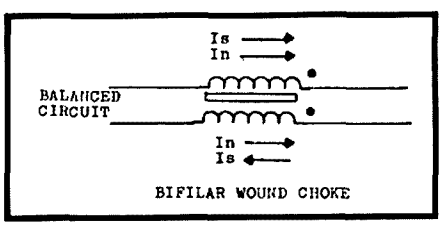


Figure 7 — Use of balanced choke to remove common mode signal component

Power cords and coaxial RF lines are often wound around a piece of ferrite to reduce radio interference into the appliance to which they are connected. In effect, this is a form of balanced choke to impede the common mode or longitudinal RF currents induced in all wires or legs of the cable. In the case of the power cord, we have a trifilar wound choke with common inductance in series with active, neutral and earth leads. The success of the choke is dependent on whether the inductive reactance, at the frequency concerned, is sufficient to attenuate the common mode current to a satisfactory level.

Common mode currents can also be blocked by the insertion of a transformer with separate primary and secondary windings, but coupling still occurs via capacitance across the windings. At audio frequency, the capacitive coupling is virtually eliminated by an electrostatic shield fitted between primary and secondary. At radio frequencies, the elimination of capacitive coupling is difficult if a high coefficient of coupling is to be maintained. Modern RF transformers are multifilar wound on ferrite cores to obtain a high coupling coefficient, making it difficult to incorporate a shield.

RF Filters

Sometimes we fit RF filters in such equipment as a nearby TV receiver to reject interference from our radiated HF signal. High pass filters such as those shown in Figure 8 have a cut-off frequency set to block the HF spectrum while still permitting passage of the VHF-UHF spectrum. Connected in series with the TV receiver antenna line, they are supposed to stop HF pick-up in the antenna or antenna feed line from being fed to the TV receiver. The filter is often ineffective because it has poor immunity to signal pick-up in the common or longitudinal mode. To include common mode rejection, either a balanced choke or a transformer with isolated primary and secondary must be added. To add a matter of interest, the combined filter with common mode rejection also works in reverse to reject TV line timebase noise from being radiated from the TV antenna line and interfering with the HF receiver.

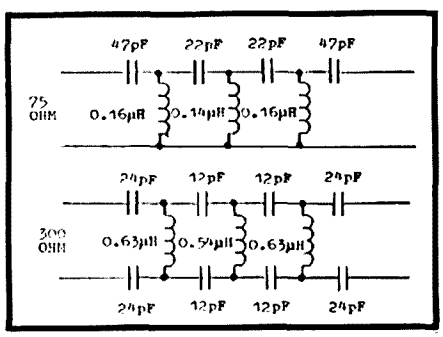


Figure 8 — Typical high pass TV transmission line filters

It must be emphasised that, to provide common mode rejection, the usual type of TV balun transformer (300/75 ohm) does not do the job. This is normally wound as an auto transformer which does not offer common mode rejection.

Coupling Due to Common Impedance

Noise in a circuit module is often picked up from another noisy module because their earth connection (or active power supply connections) are returned to the power supply bus via a common lead as shown in Figure 9A. The common lead has resistance and reactance, the latter of which increases with frequency. The noisy circuit supply current develops a noisy voltage across the other circuit via the common connection. To eliminate this type of problem, the earth lead (or active supply lead) of each module is returned separately to a single point on the supply bus as shown in Figure 9B.

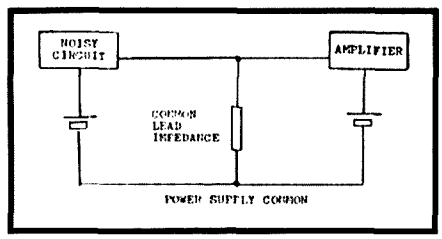


Figure 9A — Coupling via common lead impedance

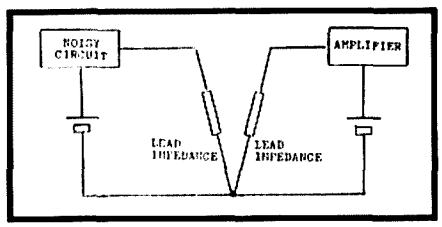


Figure 9B — Separate leads to power supply common to eliminate coupling between modules

Figure 10A shows a number of circuit modules with earths or power feed lines commoned together by looping one to the other. Where there is a chance of signal interaction between these circuits, the interaction from common lead impedance can be minimised by commoning at one point as shown in Figure 10B.

At RF frequencies, the idea of single-point earthing still applies, but as frequency is increased into the VHF-UHF region, the earthing system

can be more defined by the need of short leads in the RF layout.

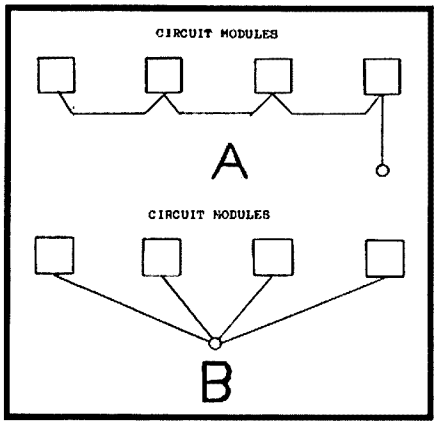


Figure 10 — Commoning of circuit modules — B preferred to A

Stage Earth Returns

Past practice in electron tube or valve amplifiers has been to use a metal chassis as a common earth plane to join earths of individual valve stages. To prevent regeneration or degeneration in an individual stage via a common impedance, good practice for high frequencies was to connect all earth returns for the stage to a common earth point at the valve socket. The common point, and only that point, was bonded to the chassis. The system is shown in Figure 11.

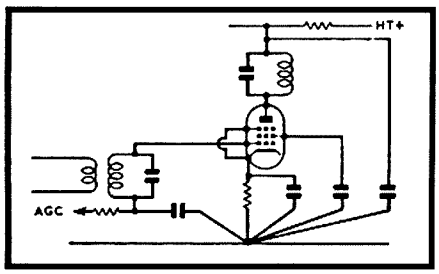


Figure 11 — Single point earth return for valve RF stage (from RSGB Radio Communication Handbook)

The same principle can be applied to solid state circuits. All earth returns for a single transistor stage, or a single integrated circuit package, are returned to the one point which is bonded to a ground plane. In using printed circuit board, the ground plane is provided by the copper sided board. There are various ways of doing this, but one way is to use one copper side of the board as the ground plane while the other is used for the printed wiring links and the component pads.

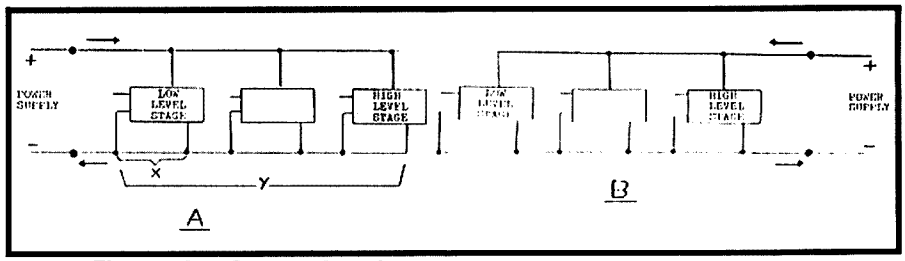


Figure 12 — Connection of power supply to in-line circuit BUS. Preferred connection to high signal level circuit as in B.

Connection of Power to Common Bus

Let us now consider a typical circuit board on which there are a number of amplifier stages starting at a low signal level and ending at a high signal level. The low-level stage takes only a few milliamps from the power rails, whereas the high-level stage runs a supply load current of hundreds of milliamps or greater. The power rails run along the board in consecutive order of the stage levels, with connections made first to the low-level stage and last to the high-level stage.

First we connect the power supply leads to the rails at the low-level stage end as shown in Figure 12A. In this case, the high current to the output stage, complete with a proportional value of ripple from the power supply, must pass through the section of the rail marked X. This can develop noise voltage across the rail impedance at X, and into the low-level stage.

Another effect is that some of the output stage AC signal current can appear on the rail so that output signal component is developed across the rail impedance shown as Y. This can cause instability because of feedback to the input stage. In an audio frequency amplifier this often shows up as low frequency "motor boating" because at very low frequencies, the power rail bypass capacitors become ineffective.

Problems of excessive power supply ripple noise or amplifier instability, as discussed, are often completely solved by re-positioning the power supply connections to the high-level stage section of the power rails as shown in Figure 12B. By doing this, the power rails connected to the low-level stages no longer carry the high current (with its high noise or signal component) to the high-level output stage. Of course, the wise thing is to connect it up the Figure 12B way in the first place.

Induction into Components

Low-level stages usually require shielding to prevent coupling from electric or magnetic fields created by higher level stages or from stray external sources. Some types of inductors have open magnetic fields and can be the cause of stray fields as well as being prone to picking up other fields. Inductors and transformers wound on toroidal cores have confined fields and hence are less prone to interference than those wound on straight ferrite rods. The miniature RF chokes, so useful to make up passive filters, have open fields and must be spaced from each other to prevent interaction. Pot cores have a winding enclosed by ferrite interaction, so that their fields are confined to the ferrite material.

To shield components from electric fields, metal screens are used. Low conductivity material, such as copper, also provides a magnetic shield at high frequencies. Eddy currents induced into the material set up an opposing field which tends to cancel the initiating field outside the confines of the screen. Ferro-magnetic materials can also be used to shield from magnetic fields. An example of this is the screen around a cathode ray tube.

So far we have described stray coupling in terms of induced noise and causing instability. In the case of passive filters, there are a few other effects, if too much coupling occurs between the inductors. This is often experienced when using those miniature RF chokes. The coupling can cause change of inductance and loss of Q, resulting in shifting of the cut-off point and degrading its slope. Loss of Q and stray input to output coupling can also degrade the out-of-band attenuation. Of course, the

effects of the stray coupling are not always obvious unless the response of the filter is measured and compared to the theoretical model.

Summary

We have discussed various ways in which unwanted signal or noise components can be coupled into our circuits, and we have suggested how this coupling can be reduced. We have dealt with lines and cables in the presence of electric and magnetic interference fields and how the degree of interference from these fields is affected by line or circuit impedance. Shielding has been covered with particular reference to care in earthing. The discussion has led into the use of balanced lines to reduce induction of interference, and the effects of longitudinal currents in these lines. Further discussion has centred around unwanted coupling into circuit modules and components and unwanted coupling between modules and components. The need to avoid certain common supply lines to different modules and the advantage of single-point earthing have also been emphasised.

Getting rid of noise pick-up or stopping interaction between circuits is often treated on a hit-and-miss basis. However, a little thought concerning how the coupling might be occurring can save a lot of trouble. Furthermore, if some of the basic precautions are taken in the first place, the unwanted coupling might be avoided.

This article is fairly basic, but it has been prepared to emphasise several important procedures in connecting up circuits. Hopefully it will provide a little help to the experimenter or home constructor in avoiding those problem bugs.

References

1. Rich, Alan — Understanding Interference-type Noise — Analog Dialogue 16-3 1982.
2. RSGB Radio Communications Handbook, Fourth Edition — Section 1, Unbalanced and Balanced Circuits — Section 4, Construction.

* *18 Ottawa Avenue, Panorama SA 5041*

ar

WIA News

Federal Convention

The 1993 WIA Federal Convention, held over the weekend of 2-3 May, saw a total of nine interstate delegates fly into Melbourne. The Convention was opened with a minute's silence in memory of past Federal President, Ron Henderson VK1RH, who died on the preceding Monday.

Held at the Windsor Motor Inn this year, the major highlight of the working sessions was an address from Chris Chenoweth, a solicitor from the law firm of Malleson Stephen Jacques. Chris spoke about proposals for the new structure of the WIA Federal organisation and aspects of the draft revisions of the Memorandum and Articles of Association. He also covered the Councillors' roles and responsibilities as directors of the Federal WIA, which is a company.

A major item of discussion on the weekend's agendas was revisions to the draft Memorandum and Articles of Association. Further work on the M&As will continue between now and the next quarterly meeting in July.

The 17 hours of working sessions were preceded by an informal gathering on the Friday night and broken by the Convention dinner on the Saturday night.

Further details on the Conventions discussions and outcomes will be included in later WIA News items.

Five Examiners Cleared

Further to a previous WIA News item advising the suspension by DOTC of seven examiners accredited to conduct licence examinations under the WIA Exam Service, the Department has indicated that five of the seven have been reinstated, following investigations. The remaining two, from Queensland, are still under suspension.

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of April 1993.

L20933	MR R R WHITE
L30843	MR G O'CALLAGHAN
L30844	MR R ROWE
L40343	MR W J BOOTH
L40344	MRS C CHILCOTT
L40345	MR L PORTER
L40346	MR G R MCNEIL
L50296	MR L R GILL
L60323	MR M R LYNCH
L60324	MR P R SMITH
L60325	MR M J STRONACH
VK1BOB	MR R M GILCHRIST
VK2GXL	MR A W THOMPSON
VK2GXQ	MR L T GOW
VK2KJU	MR N CUPITT
VK2MMX	MR J VITTORIO
VK2TCB	MR M L WARNER
VK2TIP	MR D A J SHAW
VK2XTB	MR J S TELEK
VK3BOL	MR P C LAYCOCK
VK3TQC	MR A G COTTER
VK3VJR	MR J J ROBB
VK4AR	MR G T RYAN
VK4BTD	MR T A BIRD
VK4DPL	MR P G LANGEVELD
VK4FCW	MR D BALJEVIC
VK4TEX	MR J E SANDS
VK4TMH	MR M H VAN DER LINDEN
VK4VKG	MR D K GRIFFIN
VK4YFF	MR P A GREGORY
VK5TZX	MR P J COCKBURN
VK5ZRA	MR A J ROSS
VK6IA	MR N PRYNNE
VK6KTR	MR T R ROBERTS
VK6NGW	MR G L WOOD
VK6SO	MR P BUSSANICH
VK6YT	MR R J BRADSHAW
VK7KPM	MR P J MCCAFFERTY
VK7NCC	MR J H KLOP
VK7YSH	MR S C HOLMES

ar

Have you advised DoTC of your new address

EQUIPMENT REVIEW
Kenwood TS-50S All Mode HF Mobile Transceiver

*Ron Fisher VK3OM * looks at Kenwood's latest amateur HF transceiver, "a delight to review".*

Over the last ten to fifteen years, the size of most amateur gear has shrunk in size to a very marked extent. This has been most evident with VHF/UHF equipment which is now about half the size, and delivers twice (or more) the power of the early 1980s models.

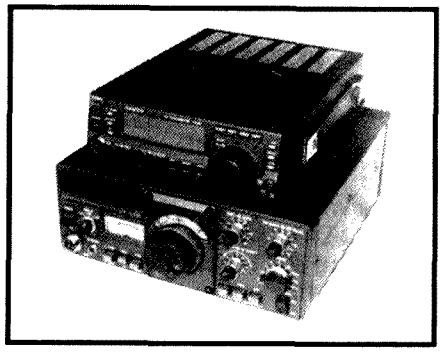
However HF mobile transceivers are still the same size and deliver the same power output as those of the early eighties. To be fair, the boxes now contain more features. In that time we have seen the addition of general coverage receivers, automatic antenna tuners, one hundred memories plus numerous bells and whistles. In some transceivers, the weight has been reduced by using plastic in place of steel for cabinet construction but still the size remains much the same.

Well now things have changed. The new Kenwood TS-50S is a fully featured HF 100 watt transceiver that is just under half the volume of the original TS-120S. Taking this one stage further, the TS-50S is actually smaller in size and about the same weight as the original Kenwood synthesized two metre transceiver, the TR-7400A. The TS-50S is a completely new development in amateur HF transceivers. It is not based on an earlier design.

This rig may well tempt many amateurs to have a try at HF mobile operation for the first time, and certainly entice many existing mobile operators to sell their old rigs and buy a TS-50S. Have a good look at the comparison photo of the TS-50S, and make up your own mind. I think you will be impressed.

The TS-50S Features and Facilities

At first sight, the small overall size is almost unbelievable.The overall



The physical size difference between the TS-50S and a TS120 is quite significant.

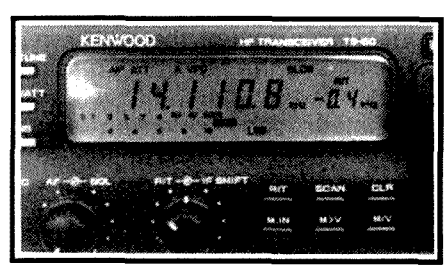
dimensions are 179mm wide, 60mm high and 233mm deep. It weighs in at only 2.9 kg. The front panel area of the TS-50S is well under half that of the TS-440S. The receiver section receives SSB, CW, AM and FM with 2.5 kHz selectivity for SSB, 5 kHz for AM and 12 kHz for FM. The same modes are also available on transmit. Receiver coverage is specified as 500 kHz to 30 MHz, but in fact the receiver covers down to 200 kHz with good sensitivity. The transmitter has three power output settings, 100 watts, 50 watts, and ten watts. As with many other facilities, these are selected via a menu set up system. More about this later. The transmitter operates on all amateur bands from 160 to 10 metres. The appropriate side band is selected automatically, but the other sideband can be selected by the push of a button. No antenna tuner is built in to the transceiver, but a miniature automatic ATU is available as an option. This matches the TS-50S in size and shape.

Band selection is via two small up/down buttons above the tuning control which select each amateur band in turn. The "MHz" button changes this to general coverage selection in either one MHz or 500 kHz steps. Each band selected remembers the previous frequency, mode, selectivity and front-end setup such as receiver preamp and attenuator. The tuning control is naturally fairly small, it measures 35 mm in diameter but is very smooth in its action. A small switch under the knob gives two degrees of tension. The first gives a smooth spinning action and the second a firm feel which would be ideal for mobile operation.

Normal tuning rate is in 5 Hz steps which gives 0.5 kHz per knob revolution. As the knob is rotated at a faster rate, the step sizes increases and so it is possible to tune up the band at a rapid rate. Frequency readout is via a large LCD multi-function display which incorporates an "S" / Power output meter and a wide selection of status indicators. As normally set up, frequency readout is to 100 Hz, but it is possible to select a 5 Hz readout via an optional selection from the menu set-up. Once this is selected you can actually get down to a one Hz readout by using the "fuzzy logic" facility. Again more about this later.

Many of the transceiver parameters can be controlled via the microphone. Four small buttons have been added to the front of the microphone which otherwise looks similar to the normal Kenwood MC-42. Each of the four buttons can be assigned any of the forty or so functions in the menu set-up. The usual up/down buttons on the top of the microphone provide for stepping in the VFO mode or memory selection when in memory mode. The VFO steps via the up/down buttons are selectable for 10 or 100 Hz, or 1, 5 and 10 kHz. In addition to this, steps on the standard broadcast band can be switched to either nine or ten kHz spacing for AM reception.

The TS-50S sports 100 memory channels. These can be programmed



The main panel and frequency readout of the TS-50S.

with frequency, mode, filter band width, AGC setting and the receiver front-end settings.

Naturally, there are two VFOs and these can be utilised for split operation. When in this mode, the transmit frequency can be monitored via the "TF-SET" which is a feature of most current Kenwood HF transceivers.

The CW operator hasn't been forgotten either. A 500 Hz CW filter is available as an option and the return to receive time is adjustable from 100 ms to 1.8 seconds. Another useful CW function is the "reverse" receive selection which allows reception on the other sideband to help reduce interference.

The TS-50S is also very suitable for data transmission.

No speech processor is included but a carrier insertion adjustment allows optimum setting of the frequency response.This is adjustable from the standard setting by – 100 to + 200 Hz. The front panel of the TS-50S is very simple. There are only five rotary controls, tuning, RIT,IF shift AF gain and squelch. Push buttons control power on/off, AT tune which switches the external automatic ATU, AIP/ATT switches the AIP and front-end attenuator. AIP or Advanced Intercept Point switches out the receiver RF amplifier to give an improved intercept point at the expense of a little front-end gain and the "ATT" switches in a 20 dB front end attenuator. The AIP and the ATT can be selected individually or in tandem.

Noise blanker is simply on or off. No adjustment is provided.The six buttons to the left of the tuning control are for RIT and memory functions. The RIT can be selected to cover either +/– 1.1 kHz or +/– 2.2 kHz. There is no transmit offset.

Above the tuning control are four buttons which control the up/down band selection, the MHz button that switches between general coverage and amateur band selection and finally the frequency lock button. In addition to the frequency lock function this button also allows access to the set-up menu system.

To the right of the tuning control are the three VFO control buttons and in the bottom right hand corner are the mode selection buttons.

Rear panel connectors are very straightforward. An SO-239 coax connector, and a standard six pin DC connector, ALC output, relay output for the control of a linear amplifier and jacks for a key and external speaker. Another six pin plastic connector provides control for the external automatic antenna tuner.

A 6 cm speaker is mounted in the top of the cabinet.

For such a simple layout a lot of features are included, so let's see how it all works out in practice.

The TS-50S on the Air

All the tests were carried out using a 13.8 volt DC power supply capable of delivering 20 amps. In hooking the TS-50S up, I note that Kenwood are now using new type fuse holders in the DC lead which incorporate automotive spade fuses. There is a fuse in each lead. The power switch on the front panel works through some sort of electronic device which requires the button to be held down for about a second. Then on it comes with "HELLO" showing on the display. After another second or so the riq comes to life.

We are ready to start work. The "Hello" message at switch-on.

The slow tuning rate of 0.5 kHz per knob revolution takes a while to get used to, but rotating the knob at about one rev per second speeds up the tuning rate to about 10 kHz per revolution. SSB signals sounded very clean although at high audio output, the speaker developed a rattle. I would think for mobile operation an external speaker would be an advantage. I connected my home station speaker and noted a big improvement in quality, especially on AM reception.

While tuning around on one VFO, I set the other to WWV on 15 MHz. From a cold start, the transceiver was 24 Hz low, and after a couple of hours operation, it finished up 9 Hz high. A total drift of 33 Hz. If this is not good enough for you (you must be fussy!), an optional high stability master oscillator is available.

After tuning around for a while, I thought it time to try out the menu set-up. This is accessed by holding down the "F Lock" button for two seconds. The two programs are selected via the VFO A/B/ button. Now there are over forty selections available so there isn't space to describe them all. Kenwood list sixteen in their feature sheet, so I will borrow those. Here we go:

1. Tx power selection 100, 50, and 10 watts.
2. Five selections of LCD display brightness.
3. AGC slow/fast set up.
4. IF filter selection.
5. CW full/semi break-in selection
6. CW pitch 400 to 1000 Hz selectable in 40 Hz steps.
7. CW reverse mode.
8. Encoder lock on/off.
9. Beep tone on/off.
10. Morse mode sound on/off.
11. Repeater CTCSS tone setting including 1750 Hz.
12. Repeater CTCSS; Burst continuous setting.
13. Meter peak hold (Tx, Rx) on/off.
14. AM BC band step 9, 10 kHz selectable.
15. LSB/USB carrier point selectable –100 to +200 Hz on Tx.
16. Automatic power off function (3 hrs fixed intervals) on/off.

Once in the menu mode, the features are selected by the tuning control and the options via the up/down buttons.

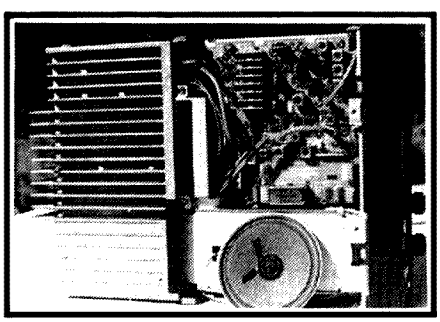
The tuning knob has a very smooth feel. There is a degree of flywheel action in the free position and a firm tension in the second. The tension control is located under the tuning control. The memory system on the TS-50S is very versatile. The 100 channels store frequency, mode, receiver front-end setting, AGC, filter setting and tone frequencies. It is possible to transfer memories from one channel to another, to scroll through the contents of the memory channels without changing the received frequency. Band scan

upper/lower frequencies can be stored in memory 99. But perhaps the best feature of all is that via the menu set-up it is possible to make the memories tunable. In effect this gives you 102 VFOs.

Scanning of the memories can be set for the whole 100 channels or in groups of ten. Scan speed is adjustable via the RIT control. For the CW operator a 500 Hz filter is available as an option. It was not fitted to our review transceiver. CW keying appeared to be very good and no clicks were noted in our test. The receiver incorporates an IF shift which enables the band pass to be shifted in relation to the filter. Its effect was similar to other Kenwood IF shift systems. I found it very useful to reduce interference mainly on the high side of the response, and also reduce the effect of noise.

As seems to be usual these days with simplified transceivers, there is no RF gain control. I get the feeling these days, with good AGC systems, that most operators leave their RF gain flat out anyway. Perhaps I am one of the old school, I like to have one, and I do use it. However, I must say that I didn't really miss the RF gain on the TS-50S. The AGC is better than most and the judicious use of the AIP or attenuator overcame most of my problems. The squelch control works on all modes but would be of greatest use on FM. This was checked out on the 29 MHz band and found to be satisfactory.

The peak hold function on the "S" meter is useful. The last bar on the bar-graph holds for a second or so after the others have dropped away leaving the peak signal reading clearly visible. I know that many amateurs don't like bar-graph meters. Well this one works well, and it is hard to see how an analogue meter could have been fitted to this transceiver anyway.



View with top cover removed.

After a while, the urge to actually put it on the air became too great to resist, so some tests were arranged with Bill VK3ARZ. There is no microphone gain control for SSB as such. In the menu set-up two gain settings are selectable. All tests were carried out with the "High" setting. We optimised the audio response again via the menu set-up and found that +50 Hz from normal sounded best. This is adjustable in 10 Hz steps so you can set the quality "spot on" to suit your voice characteristics.

It sure is easier than opening up the transceiver and adjusting the carrier oscillator trimmers. After all this the audio was rated as excellent with plenty of punch. No speech processor is included in the TS-50S, but nevertheless the audio sounded very full. After several minutes of transmission, the heat sink at the rear of the cabinet became warm only. The internal cooling fan started up and ran for a few minutes keeping the heat sink at a constant temperature. The fan is audible but not too intrusive. Certainly, when mobile you would not hear it at all.

During these tests, Bill checked for intermodulation distortion and the results of this are included in the test section of this review. Unfortunately neither of the automatic antenna tuners were included with the review transceiver. They both look most interesting and I hope I might get an opportunity to look them over in the future.

Finally, I had a look at the "fuzzy logic" used in the tuning system of the TS-50S. This enables you to tune between the normal 5 Hz tuning steps, in effect to give you 1 Hz tuning. By giving the tuning control a quick flick any number between zero and five can be produced. The tuning will still progress in five Hz steps, but instead of starting at zero or five, might start at three. Most interesting to play with but possibly not a great deal of practical use.

The TS-50S on Test

First off, I checked the power output on transmit and the current drain. The three power settings were checked at 14.2 MHz and then the high power output was checked on all bands.

Setting	Power out	Current Drain at 13.8 v
10 watt	9 watts	5.8 amps
50 watt	48 watts	12 amps
100 watt	95 watts	18 amps

Power output CW mode on each band

Band	Power out
160	105 watts
80	100 watts
40	96 watts
30	95 watts
20	95 watts
17	95 watts
15	95 watts
13	92 watts
10	90 watts

PEP output on SSB was about 5% higher than the CW figures.

It is interesting to note that the TS-50S specification makes no mention of the intermodulation distortion. While I don't have access to a spectrum analyser, a few tests were carried out to make an estimate of the distortion using a TS-940S as a standard. The TS-940S is rated at -37 dB for a third order distortion against a single tone output, which equated to -34 dB for a two tone signal. Our tests were carried out using normal speech modulation. We came up with a figure approximately 10 dB worse than the TS940S, which is significant.

Receiver Tests

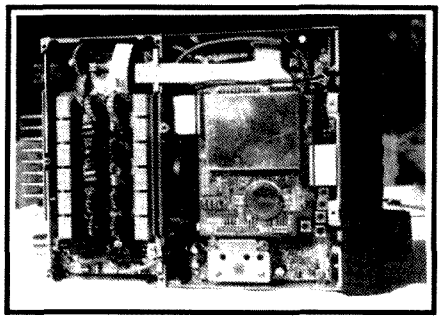
The first test was to check the "S" meter calibration.

S1	1.0 μV
S3	1.3 μV
S5	2.4 μV
S7	5.2 μV
S9	24.0 μV
S9 + 20 dB	240.0 μV
S9 + 40 dB	2.6 mV
S9 + 60 dB	.02 V

These tests were carried at 14.2 MHz. The AGC was checked at the same frequency.

Increasing the signal generator output, I found that there was no increase in audio output once the level reached 1 μV. This is an excellent figure.

An 8 ohm load was connected to the external speaker output, and output and distortion were measured



View with bottom cover removed.

using a 1 kHz beat note. Maximum output was 2.5 watts. The specified output of 2 watts with 5% distortion was met exactly. With the audio output reduced to 0.5 watts, the distortion measured 1%. With the audio gain control at zero, the residual noise output was -80 dBm. You won't have trouble with hiss or hum when using headphones on the TS-50S.

The audio frequency response on SSB was then checked. At the low frequency end the -6 dB point was 150 Hz, and at the top end 2700 Hz was — 10 dB. It appears that Kenwood are using a degree of high frequency tailoring in the audio amplifier, as the "S" meter holds up to within — 2 dB at 2700 Hz.

The overall sensitivity of the receiver was measured. This was within +/– 1 dB from 1.8 to 30 MHz. The figures here were taken at 14.2 MHz.

For 10 dB SINAD an input of 0.12 μV was required. With the AIP switched in, this increased to 0.3 μV and with the attenuator in the reading was 2.8 μV. Of course it is possible to select both the attenuator and the AIP together but it's hard to see why this would be needed.

Finally, the selectivity was measured, again at 14.2 MHz and in the SSB mode.

The -6 dB was 2450 Hz and the -60 dB width was 3.9 kHz. Overall these results are very good. The only doubtful point is the intermod distortion which could be better. If the TS-50S is used mobile with a whip antenna, there would probably be no great problem, but if the transceiver was used at home with an efficient antenna, and possibly a linear amplifier, it could cause trouble. Kenwood might like to look into this.

The TS-50S Instruction Manual

The instruction manual runs to 60 pages which are crammed with information. Sections include installation both for mobile and fixed station operation. Controls and connectors are described very well over eight pages. Chapter three shows how to operate the transceiver in the four normal modes, plus data operation. Chapters four and five cover memory and scan functions. Chapter six is appropriately titled, "Other Useful Features". Indeed they are. Subjects covered include the operation of the dual VFOs, the IF shift and noise blanker. However chapter seven is without doubt the most interesting. It's here that the menu setting procedure is covered. This gives an insight into the wonderful facilities built into the TS-50S.

However, my usual grouch with instruction books, there is no technical description. A circuit diagram is included as is an almost complete specification. I score the instruction book an eight out of ten.

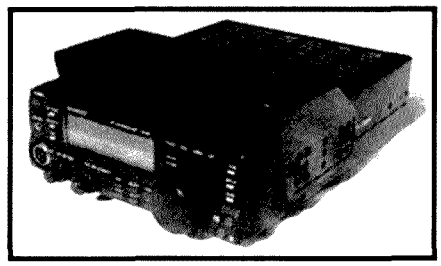
The TS-50S Conclusions

There is no doubt about it, the TS-50S is in a class on its own. It offers all the facilities needed for mobile operation and would make an excellent home station rig where space is limited. In some respects the performance is not quite up with the current larger transceivers, but it's not too far behind either. If you are using an older rig then the performance of this little transceiver will probably amaze you. Every time Kenwood bring out a new line of transceivers, they bring in updates that then carry on to the next models. With the TS-50S, the menu set-up system is one of the greatest advances for a long time.

However, I will conclude this review with a couple of "why don't they's".

Why don't they make the front panel removable? In many cases, even a transceiver as small as this might be hard to fit into a modern car.

Why don't they produce an AC power supply about the same size as the TS-50S? That would be wonderful for portable operation.



TS-50S with Mobile mounting Bracket.

I must admit that it has been a delight to review the TS-50S. I just might be tempted to acquire one before setting off for Northern Australia later this year.

The TS-50S is priced at $1,549-00. The AT-50 automatic ATU is $599, and the PS-32 power supply which can power both the TS-50S and the AT-50 is $466-00.

My thanks to Kenwood Electronics Australia Pty Ltd for the loan of the review transceiver.

* *"Gaalanungah", 24 Sugarloaf Road, Beaconsfield Upper Vic 3808.*

ar

WIA News

A Hitch In Time

This month will be an extra second longer.

The International earth Rotation Service (IERS) has announced a "leap second" will be added on June 30th. The effect will be to retard Universal Coordinated Time (UTC) by one second.

The Story of Kingsley Radio Pty Ltd, 1938 to 1945 — Part 1

*George W. Neilson VK3TES * relates his activities with an old War Horse, the AR7.*

George Neilson VK3TES ex Kingsley Radio

Author's Note:

In this my version of the "Kingsley Radio Story" I have chosen to use "first person" because I convinced myself that the repetition of "I" would be no more boring than "the writer". I have mentioned those associates whom I can remember but I know that there will be many whose names now evade me in my advanced years. To them I offer my apologies for any errors and omissions. My recollections are mainly highlights and cannot do justice to many of my former colleagues.

Radio began for me when I was about eight. My father brought home a crystal radio set, probably from one of the many 1920s second-hand shops. Inquisitive, I had to find out how this amazing device worked. Some time later when no one was around I took the radio out of its box. What I saw did not help me much but I believe that was the moment when my career in Radio was launched.

I completed school in year ten (1933) at Northcote High School. At school I learned the rudiments of radio in a hobbies class. At the beginning of 1934 I was fortunate enough to obtain a job in a hardware shop. What money I could save was spent on buying radio parts to build a receiver. Already I was attracted to Amateur Radio stations, who operated in those days on the broadcast band on Sunday mornings. A fellow Scout, Ron Pollock, had a similar interest and initially we pooled our resources to build a short wave receiver.

At that time Ron had enrolled in a radio course with a Melbourne business college. This college had contracted Kingsley Radio to do the teaching which was carried out at their factory by the staff. During this course he was able to obtain a job with Kingsley.

In 1938 my employer closed, so I was looking for a job. Ron Pollock told me that Kingsley wanted another employee at that time and so I started working for Kingsley Radio Pty Ltd at their factory in Spring Street Melbourne. The Managing Director was Howard Kingsley Love — universally known as HK — well known in the radio trade, and an active Amateur Radio Operator, callsign VK3KU. HK had a secretary named Mollie Malone. The Chief Designer was Jack Gostelow who subsequently went to AWA, the serviceman was Johnny Bremner who eventually went to Rose Morris in South Melbourne and the foreman, Norm Connell, later set up a business making taxi-meters. Others of that era whom I remember were Brian Irwin, Max Downes and his brother Charles. Another employee, who left just before I joined was Harry Fuller VK3HF, who got his Commercial Broadcast licence, worked for 3SR Shepparton and subsequently became Chief Engineer of 3YB Warrnambool.

HK Love and Harry Fuller were notable as radio operator members of the Donald McKay expedition to Central Australia in the 1930s. This expedition was first to use both Radio and Aircraft, and has been referred to in the book "The Last of the Australian Explorers" by Frank Clune.

Kingsley Radio was noted in the industry for its "High Fidelity Radio" employing what was in those days a hot potato, "Direct Coupling". Their Hi-Fi models employed a 2A3 triode output stage direct coupled to the driver stage. These models sold largely on their reputation with satisfied customers. There were also conventional five and six valve dual wave console models and four and five valve battery operated models which sold very well through country agents. They were very economical, vibrator powered from a six volt accumulator. The five valve model power consumption was 0.67 amp. without the dial lights on. There was also a 32 volt model for farm power systems.

I started as "the boy" although I was nineteen, went the messages, got the lunches, made the tea and in my spare time slowly learnt the various skills of the radio trade. I started doing sheet metal work making chassis using a three foot treadle operated guillotine and hand operated bender. These were augmented by a bench mounted hand operated nibbler known as a pattern cutter (a tool used in the boot and shoe industry). Our contribution to "high tech" industry was a bench mounted "Waldown" drill. There were no presses or hole punches. Holes for valve sockets etc were cut with a "Tank Cutter" mounted in a standard hand brace, the cutter being made of a steel slightly harder than lead, often needing several sharpenings to cut one hole! The chassis were assembled with bolts and nuts — no spot welder — and to paint them we had a hand operated spray gun consisting of an old fashioned car tyre pump mounted on the side of a small air tank. After five minutes furious pumping one got about fifteen seconds spray time! Sometimes the foreman, Norm Connell, wanted to do some painting and expected me to keep up with the pumping while he sprayed. All this was done on a landing on the stairs, no fancy spray booth with exhaust fans for us.

From sheet metal I worked up to assembly, wiring and then the real top shelf stuff — testing. My mentor now was Johnnie the serviceman, soon to

become The Chief Engineer as the company started to expand. Johnnie had a story when people asked him "How does radio work?" He would say.

"Can you imagine a very long dog with his head in one town and his tail in another town?"

"Yes."

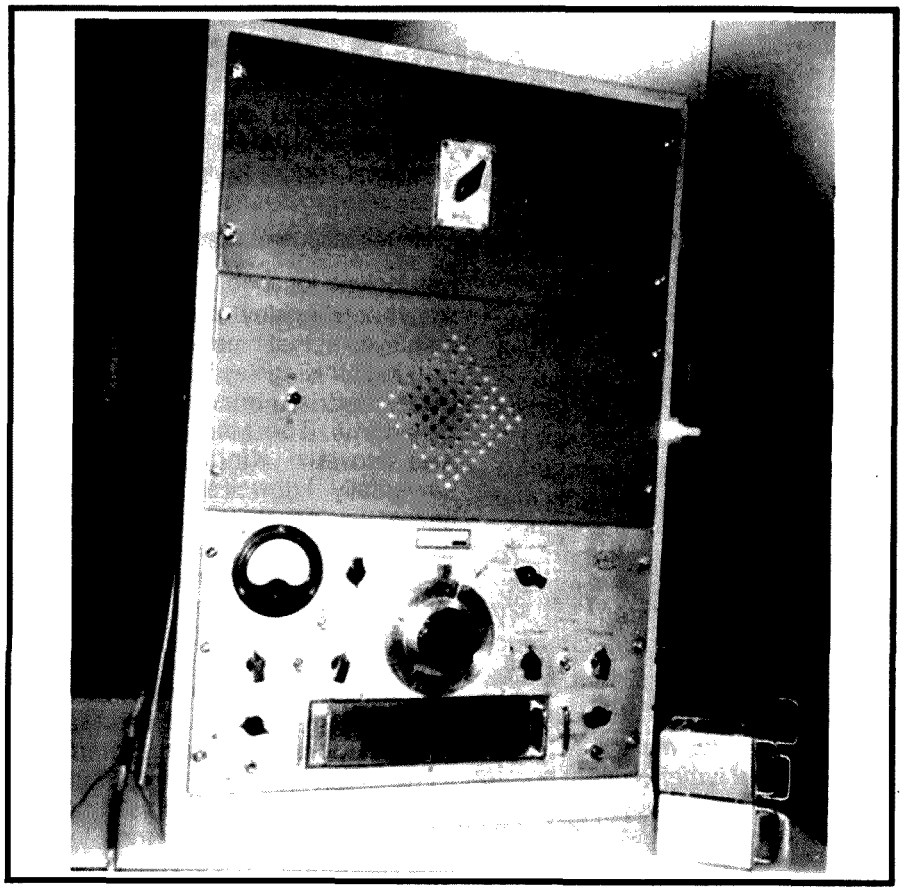
"And can you imagine that if you squeeze his tail in one town he will bark in the other town?"

"Yes. Gee, is that how radio works?"

"Well, it is if you take away the dog!"

"Uncle Fred was removed from his own private hell and I never saw him again . . ."

We also manufactured Diathermy machines, a simple but fairly high powered short wave generator, used in medical services for applying internal heat to various parts of the body and for coagulation during operations. Johnnie had an uncle who came down to Melbourne from the bush one day. After inspecting most of the pubs in the city and apparently finding them all to be in good working order he wandered into the factory slightly the worse for wear. Johnnie had just finished servicing one of these Diathermy machines and decided that as Uncle Fred was complaining about a crook knee he would be a suitable test piece. So he strapped the rubber pads on the end of the connecting cables on either side of Uncle Fred's crook knee, cranked up the power and went away and left the uncomplaining Fred. Typically, something else took Johnnie's attention and Uncle Fred was forgotten. Eventually the pennies dropped and Johnnie, in some trepidation rushed back to see if Uncle Fred was still with us. There he was, still sitting patiently on the chair, still uncomplaining, very red in the face although on reflection I'm not sure whether because of an overdose of short waves or long drinks! Uncle Fred was removed from his own private hell and I never saw him again, so I cannot report whether his leg fell off or his rheumatics were cured!



The AR7 receiver designed and constructed by Kingsley Radio. This receiver has been restored to mint condition by amateur radio volunteers. It is currently displayed at the Sciencworks Museum, Victoria.

Being a small company we were always involved in new ventures. There was a movie starring Spencer Tracy and John Garfield (I think) called "Captains Courageous". In this movie they made use of a schooner — in the picture I think it was called "We're Here" — but its real name was "Henrietta". It sailed into Williamstown one day and we were contracted to fit marine radio to it. The equipment was designed by Jack Gostelow and made in the factory before being taken to Williamstown for installation. Working on this ship as well as helping to make the equipment was one of the many pleasant diversions which made life interesting.

Our illustrious chief HK had been a Major in the Australian Army in the first World War, then transferred into the Flying Corps where he trained as a fighter pilot, went back to the front, was shot down nine days later and spent the rest of the war in a POW camp from which he made several unsuccessful attempts to escape. He was still on the RAAF Reserve and had a lot of friends in the various services. In hindsight I guess he knew a lot more than the lay public about the fast-approaching Second World War.

We next tried to sell Radio Communication equipment to the Melbourne Harbour Trust for their fleet of ships — hopper barges, dredges and tugs. We set up a base station at "Dockhead" the control centre between North Wharf and Victoria Dock. A "mobile" station was set up on one of the hopper barges — the William Cowper — which carried the spoil from the dredges to be dumped at a special area of the bay.

Again several very pleasant days were spent "swanning" up and down the bay. The boss picked beautiful weather for the trials. Unfortunately we always seemed to be the pioneers who did all the development work and

sowed the seeds for somebody else to reap.

The next project was to convince the army that they needed new radio communication equipment. Two prototype portable transceivers were made and installed in HK's and Johnnie's cars and we headed off, HK to Mt Dandenong and Johnnie with his girlfriend and me (a slightly unwelcome chaperone) to the Mornington Peninsula. I still have vivid memories of the six foot length of electrical conduit tied with string to the spare wheel of Johnnie's 1937 Chevrolet to be an aerial, the tyre acting as an insulator. Again the boss picked great weather and occasionally we made contact between the two cars. Again we were doomed only to demonstrate our pioneering spirit.

But all was not lost for while we didn't make the grade with the Army we persuaded the Air Force to buy the portable equipment known as the ATR1 operating on HF. This seemed to be the turn of the tide.

The Air Force issued a Specification for a Communication Receiver, so for the first time we could really let our heads go. Never had I seen so much effort devoted to the design of a receiver to meet this specification with everybody on our small team contributing. I believe that the original concept to base the receiver on the American "National HRO" came from HK with his Amateur Radio background. As a piece of Armed Service equipment it was deemed essential to have maximum ruggedness. The traditional glass dial of conventional receivers was considered not acceptable. A prototype "HRO" type dial mechanism was made by H Alger and Sons who were precision instrument makers allied to the Movie Projection industry.

Due to some commercial problem later production of these dials was by Bryant and Hunter also of the Movie Projection industry. The electronic and mechanical design was by Jack Gostelow, Johnnie Bremner and Norman Connell, aided by HK. I had the great pleasure of designing the layout and performing the wiring of the prototype of the "KCR-11" — as it was called — which was submitted for assessment.

Bill Gronow VK3WG (former WIA Federal President) and Allan Doble VK3AMD at the official handing-over ceremony of the restored AR7 to the Scienceworks Museum in November 1992.

The KCR-11 — to be known as the AR7 in the RAAF — was designed as a rack mounting system and consisted of three units, the Receiver, the Power Supply and a Speaker Panel all mounted in a steel rack about a metre high. There were two RF stages, mixer, Crystal Filter, two IF stages, detector, AGC and audio amplifier, BFO and power output stage. The dial drive was a twenty to one worm drive with anti-backlash giving ten turns of tuning. The dial, 12 cm in diameter, had fifty graduations. Each tenth graduation had an elongated hole exposing a second plate behind the dial photo-engraved with a set of fifty one numbers — from 0 to 500. By simple gearing this numbered dial was driven by the tuning dial so that the actual dial position between 0 (minimum capacity) and 500 (maximum capacity) showed through the holes.

The coil boxes were copper sheet, nickel plated, and a set of four coils was mounted on a steel front plate which carried two handles and a stainless steel engraved graph of the frequency tuning for that set of coils. The crystal filter was designed in-house and the crystals were made by the late well-known Max Howden VK3BQ. The crystal holder was assembled in-house also. The power supply was designed to operate from 240 volts AC or 12 volts DC. The coils covered from 150 kHz to 430 kHz in one set, and from 535 kHz to 25 MHz in another four sets.

* *48 Garden Street Blairgowrie Vic 3942*
ar

Stolen Equipment

Stolen May 1993 from VK6SI at South Perth, ph: 4774 2115. Kenwood TW1000A dual-band 2m/70cm FM. Serial No 8052033, complete with microphone and antenna diplexer.

Stolen 20th April 1993 from vehicle while in Queen Victoria Building car park, Sydney, ICOM IC27H 2m mobile transceiver, mounting bracket (and half the dash board!). S/N plate missing, inscribed with drivers licence 6613SM (NSW). Rear heatsink broken and epoxied. Enquiries to John Latham VK2KFK (044) 232 855 bus, (044) 216 620 A Hrs.

Stolen from Dick Smith Electronics, Coburg Store, two (2) YAESU 2 metres FM hand held transceivers. S/Ns 2I 172773, 2I 173633. Contact George Alexandrakis, Area Manager, Dick Smith Electronics, 656 Bridge Road, Richmond Vic 3121. Tel (03) 428 1614, or any Dick Smith store.

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

"Simplex" Sideband Transmitter for 3.580MHz

*Drew Diamond VK3XU * has built a cheap 3.580 MHz Transmitter, without fancy parts or tools.*

It is the easy availability of cheap 3.580 MHz crystals that got me thinking- "Wouldn't it be fun to have a go at building a simple single frequency SSB transmitter for that spot?" Being in the mainstream of a popular band, contacts can easily be had on this frequency at night, even with a power level of only a few watts. No fancy parts or tools are required, and all components are available locally. The prototype has the following measured characteristics:

Performance

Frequency:	3.580 MHz, LSB.
Output Power:	4W PEP.
Carrier Suppression:	-42dB.
USB Suppression:	-45dB.
Harmonics:	-50dB.
Output Tolerance:	Will withstand any load SWR, including short or open circuit without damage.

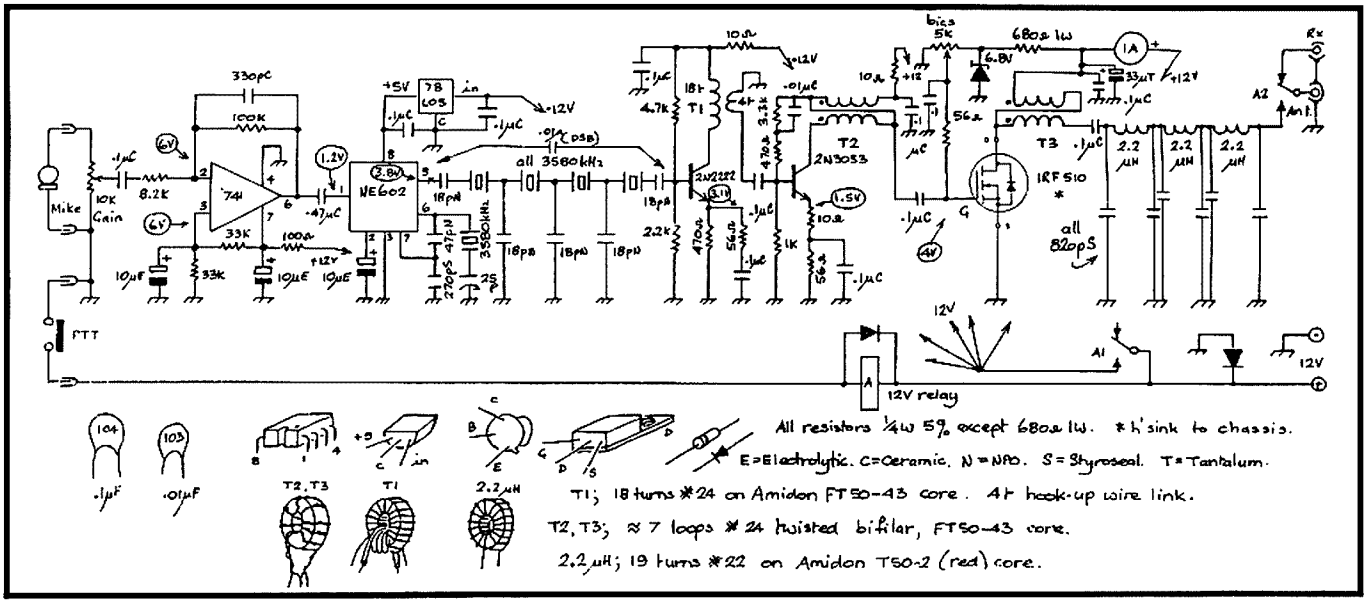
Circuit

Double sideband (DSB) is generated in the NE602 balanced modulator chip, where amplified microphone audio is applied to one of the differential inputs at pin 1. The '602 internal Colpitts connected oscillator transistor maintains the 3.580 MHz crystal in oscillation (pulled high with series C to about 3.5802 MHz) to supply the 'carrier'. No signal appears at the '602 output until audio is applied to pin 1, which upsets the excellent balance at audio rate, thus generating a DSB signal. The simple ladder filter has a band-pass of about 1.8 kHz, which admits the lower sideband only, the upper sideband being greatly attenuated. The resulting microwatt SSB signal is raised in easy increments through a three stage broadband linear amplifier to about the 4W level. The output stage employs a single IRF510 power MOSFET. These make cheap and effective RF power amplifying devices to about 10 MHz, and are virtually indestructible in this configuration.

Construction

A famous home economics book has, on the title-page, the motto; "life's too short to be stuffing mushrooms". Do radio/electronics enthusiasts spend too much time in "stuffing mushrooms"? That is, do we amateurs really need elaborate printed circuit board(s) for every one-off project that we build? I sometimes think that home construction is being hindered, rather than aided, by the blind perceived need for a circuit board. End of soap-box outburst.

The circuitry was built "ugly" style on a rectangle of double-sided circuit board measuring 75 x 175 mm. With a little care and practice, the end-product can be not so ugly — in fact quite presentable. The components are soldered together, joined where necessary as you follow the circuit. The '741 and '602 should be fitted into wire wrap sockets, and the pins gently flared out, except the ground pins, 4 and 3 respectively. These are soldered direct to the foil. Components which have one leg to ground are sufficient in number to provide numerous anchor points for the remaining components. Keep leads reasonably short, particularly RF by-pass capacitors, source of the IRF510, and filter components. In addition, try to keep the whole thing on a low profile, thus making use of the ground plane properties of the board. Where there is a possibility of components shorting to ground (coils and transformers for example), stick a little square of tape onto the board. For best results, use capacitors of the



"Simplex" Sidebander for 3.580 MHz — VK3XU.

types specified. At only slightly greater cost, monolithics make excellent by-pass/coupling capacitors, and offer a saving in space. Disc ceramics may be substituted for polystyrene/styroseals in the output filter at cost of slightly increased loss. A 1500 pF "Greencap" may be substituted for each pair of 820 pF in the output filter. Micas may also be used if available. The 33 μF at the PA must be a tantalum type for low impedance at MF, thus providing effective AF through HF de-coupling.

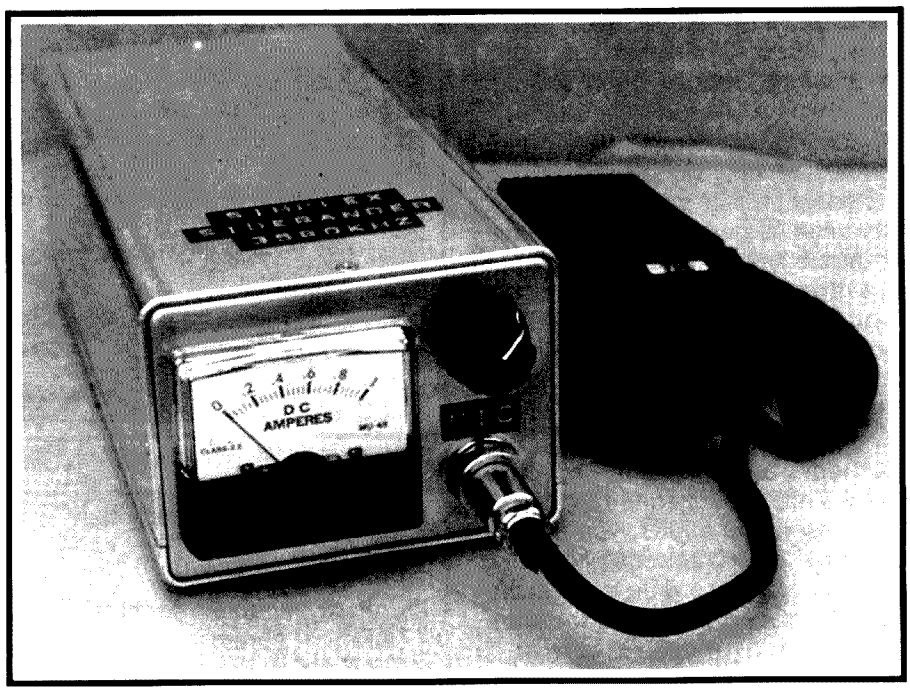
When the '741 and '602 stages are wired, operation may be checked by temporarily connecting 12 V and listening for the DSB signal on the station receiver.

For effective heatsinking of the IRF510, cut a rectangular hole in the board so that it may sink excess heat into the chassis. The drain is also connected to the mounting tag, so remember to fit insulating hardware at the interface. The source pin may then be soldered directly to the foil.

The 4:1 broadband transformers are made as follows. Take two 200 mm lengths of #24 B&S enamel wire. Twist them together at each end, and fix one end into a vice, the other end into the chuck of a hand drill. Whilst maintaining tension, turn the drill until you have about three twists per cm, then give the drill a tug to "set" the pair. Carefully wind the pair onto an Amidon FT50-43 core, about 7 loops should fit nicely. Cut the wires leaving about two cm each. Scrape the enamel from all four wires, and using a multimeter on ohms, identify each of the two "windings". Now connect the end of one to the start of the other. Winding starts are shown schematically with a dot.

This is "direct-generation" sideband, so the signal frequency from start to finish is the same as appears at the output. To avoid instability problems (the antenna may feed a signal directly back into an earlier stage), the transmitter must be housed in a metal box of appropriate dimensions. The case shown is a Horwood type 34/8/DS measuring 102 x 76 x 204 mm.

Power supply, nominally 12 or 13.8 V at up to 1 A, may be internal or external to suit requirements or preference. The popular 2155



"Simplex" Sidebander

transformer/4-diode bridge/2500 μF capacitor/7812 regulator configuration would be ideal. A second 2500 μF capacitor at the regulator output is also recommended to supply any transient current demand. A 12 Vdc relay with two sets of changeover contacts may be used to effect antenna switching between Tx and Rx from the push-to-talk button on the mike. The relay should be mounted close to the output components and the Rx/Ant connectors to avoid need for wiring with coax. If your relay must be located more than a few cm from any of these, make the connection(s) with miniature 50 ohm coax, grounded both ends.

"A whistle should produce a few watts of power at the load."

If you have a meter of 1 amp dc sensitivity, it would be useful to have it connected in the drain supply line to the IRF510. Indicated current gives a good idea as to what's going on. With a 50 ohm load, speech should flick the current up to about 800 mA on voice peaks, and you can keep an eye on the standing (no-signal) drain current.

A DSB version is possible. Omit the ladder filter and connect the output pin 5 from the '602 via a 0.01 μF capacitor to the base of the 2N2222. For DSB, the crystal trim capacitor may be replaced with a panel mounted variable capacitor, about 100 pF, to give a useful degree of VXO shift. No shift is available for SSB.

Adjustment

Check your hook-up, and confirm that all polarised components are correctly placed. Connect a 50 ohm dummy load/power meter (a 12V/4 W auto lamp will do) to the output. Set the 5 K bias pot for zero volts, and mike gain pot to minimum. Plug in your microphone (an ordinary dynamic radio push-to-talk type, about 200 or 600 ohms). Apply power. In TX mode, adjust the bias pot for a standing current of about 300 mA. No output power should be indicated, and adjustment should give a smooth change in current. Whilst speaking, turn up the mike gain until the drain current flicks up to about 700 or 800 mA. A whistle should produce a few watts of power at the load. Listen to the signal on your receiver (headphones will be required to avoid feedback). Adjust the crystal trim capacitor for natural sounding

sideband, being neither "woolly" nor "tinny". About 5 pF worth, or plates just meshed being a good starting point.

Assuming that the receiver is not overloaded, the signal should be clean and free of splatter, hum, or other unpleasant sounds. If you have an oscilloscope, check the RF output waveform. Peaks should be nicely rounded, with no bright bands anywhere on the envelope, and no appreciable carrier when the mike gain is at minimum.

To aid in any necessary troubleshooting, some key dc voltages are shown on the circuit. If, after reasonable efforts, you cannot make your transmitter work satisfactorily, please write to me at the address above. An SASE would be appreciated.

Parts

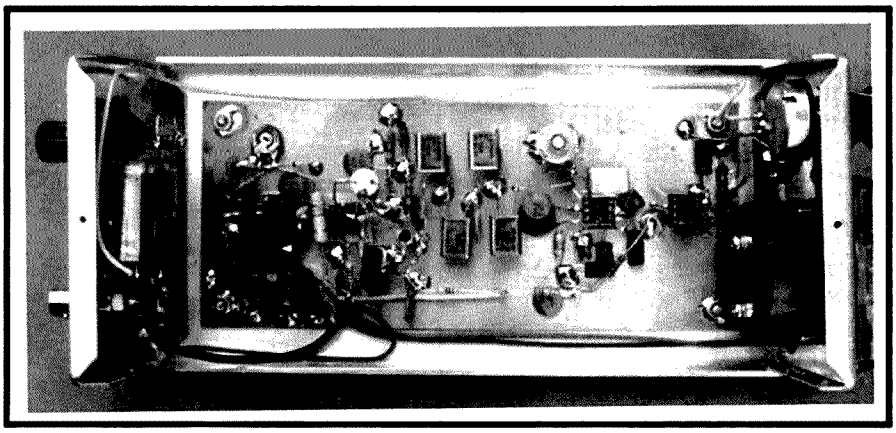
None of the components are difficult to obtain, and most may be purchased from the usual electronics retailers. In addition, NE602's and toroidal cores are available from Stewart Electronics and Truscotts Electronic World. Both firms will answer mail orders. Other Amidon suppliers advertise in this journal. Check local electronics magazines for best prices on crystals.

A Bigger Signal

With a reasonable or good antenna, the 4W signal should provide interstate contacts at night, although the going could be tough over long distances under noisy conditions. As a follow-up project, the output power may be boosted with a suitable linear amplifier. One similar to that described in Reference (5) is suggested, with due consideration to TX/RX antenna changeover connections.

Further Reading

1. "The Ugly Weekender" — R. Hayward & W. Hayward, QST, Aug "81.
2. Build It Yourself from QST — Hale, KB1MW, QST April-July '92 (serial).
3. How to Lay Out RF Circuits — White, G3SEK, Rad Com Feb/Mar '91.
4. NE602 Primer — Carr, Elektor Electronics, Jan. '92.
5. 25 W MOSFET Linear Amplifier — Diamond, AR Jan. '91.



"Ugly" Board Construction.

Parts List for "Simplex"

Capacitors	Qty
18 pF NP0 ceramic	5
25 pF air variable "beehive" trim cap	1
47 pF NP0 ceramic	1
270 pF polystyrene/styroseal	1
330 pF ceramic	1
820 pF polystyrene/styroseal (see text)	6
0.01 μF ceramic (or 0.047 μF)	1
0.1 μF ceramic (or 0.047 μF)	9
0.47 μF non-polar (ceramic or monolithic)	1
10 μF electrolytic)16 V	3
33 μF tantalum)16 V (or 47 μF)	1
Resistors	
10 ohm 1/4 W	3
56 ohm 1/4 W	3
100 ohm 1/4 W	1
470 ohm 1/4 W	2
680 ohm 1 W	1
1 kohm 1/4 W	1
2.2 kohm 1/4 W	1
3.3 kohm 1/4 W	1
4.7 kohm 1/4 W	1
5 kohm flat mount trimpot	1
8.2 kohm 1/4 W	1
10 kohm log pot	1
33 kohm 1/4 W	2
100 kohm 1/4 W	1
Semiconductors	
LM741	1
NE602	1
78L05 5 V regulator chip	1
2N2222, 2N3904 etc.	1
2N3053, BFY50 etc.	1
IRF510, IRF511, MTP4N08 etc.	1
6.2 or 6.8 V 400 mW zener	1
400 V/ 1 A diode	2
Miscellaneous	
— FT50-43 core (2)	
— T50-2 (red) core (3)	
— #22 (0.63 mm) and # 24 (0.51 mm) enamelled wire	
— case to suit	
— circuit board material (double or single-sided)	

(Continued overpage)

— mounting hardware for IRF510
— 8-pin DIL wire wrap sockets (2)
— 3.57945 MHz crystals (5, all identical)
— 12 V relay with two sets of changeover contacts
— coax connector for RX (BNC or RCA)
— coax connector for antenna (UHF)
— connectors or lead for 12 Vdc
— 4 pin mike connector
— pot knob
— screws, nuts, washers, rubber feet
— 1 Adc meter
— power supply or components for same (see text)
— wet weekend (1 or 2). * *"Nar Melan" Gatters Road, Wonga Park Vic 3115.*

ar

SSB Phasing Techniques for Receiving

*Richard Hosking VK6BRO * discusses the requirements of an SSB Direct Conversion receiver, and various design compromises are explored.*

Amateur radio nowadays is dominated by complex black box equipment which is practically impossible for the average homebrewer to emulate. However there is still a place for homebrew equipment in the amateur shack. Many designs for direct conversion receivers have been published in recent years to cater for the homebrew enthusiast. These have the advantages of simplicity and reproducability.

However their drawbacks are significant for any serious application. The audio image cannot be removed with conventional filtering meaning that they are prone to adjacent channel interference in todays' crowded bands.

Some designs suffer from rather poor strong signal handling which is a problem not unique to the direct conversion design but rather a function of mixer performance.

The direct conversion design requires very good performance from the audio amplifier which follows the mixer. It should have very low noise and high gain. As all or most of the gain in the receiver occurs at audio care must be taken to avoid instability especially due to common paths via power rails. Due to the high amplifier gain microphonics can be a problem.

At the cost of slightly increased complexity many of these problems can be overcome.

SSB Phasing techniques

There are several methods by which one sideband of a double sideboard signal, the audio image, can be removed. The conventional circuit uses a sharp filter, usually a crystal or mechanical device. See fig 1. The filter is relatively expensive and the circuit is limited to one frequency of operation. However this method gives the best currently available performance.

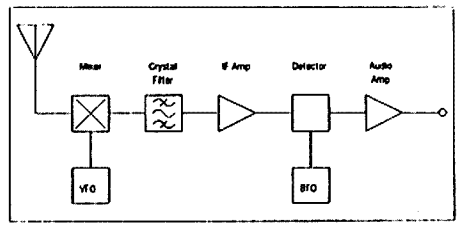


Figure 1 Filter Method SSB Receiver.

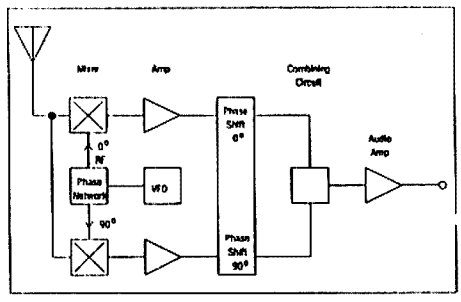


Figure 2 Phasing SSB Receiver.

The phasing method is well known and was widely used in the past. See fig 2. Two mixers are fed with RF local oscillator signals in phase quadrature (90 degrees out of phase). In a receiving system the output from the mixers is passed through audio phase shift networks which give 90 degrees of audio phase shift to one signal relative to the other. When the signals are recombined one sideband is cancelled. The difficult part has always been to obtain accurate 90 degree phase shift over a wide enough bandwidth and this is the reason that these methods have fallen into disuse. However new techniques have become available in recent years which overcome many of the previous problems and make these circuits attractive again.

RF Quadrature Generator

Previously published phasing designs have used passive networks to produce quadrature RF signals. It is possible to obtain a decade bandwidth with these circuits but they use critical components and have never been popular.

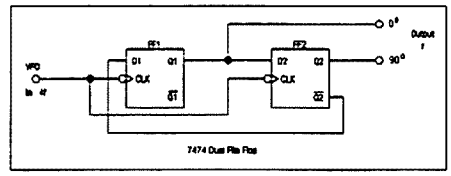


Figure 3 RF Phase Shift Network.

With the advent of digital circuits a new approach is possible. Quite accurate quadrature signals can be generated using two flip-flops in a ring configuration See fig 3. The circuit utilizes a dual edge triggered D flip flop type 74LS74. The VFO input at TTL level is fed to the clock inputs of both flip flops. The Q output of the first device FF1 is fed into the D data input of the second. The NOT Q output of the second device FF2 is fed back to the D input of the first. The flip flops will only change state at each negative transition of the clock input. At the next clock transition and not before the Q output will follow the D input. The NOT Q output will always be in the opposite state to the Q output. Thus if we assume the Q pin of the first device is initially logic 0 (low) at the next clock transition the Q2 output will follow. The NOT Q2 output will be logic 1, the opposite state. This in turn will force Q1 high at the next clock transition as NOT Q2

is connected to D1. FF2 is then forced to change state at the next clock transition and thus the cycle is repeated. Due to the propagation delay of the gates in the flip flop the circuit does not change state instantaneously and the output does not catch up with the input. The result is two outputs at a frequency one quarter of the clock input frequency with one lagging the other by one clock cycle or 90 degrees. This can be seen from the timing diagram. See fig 4.

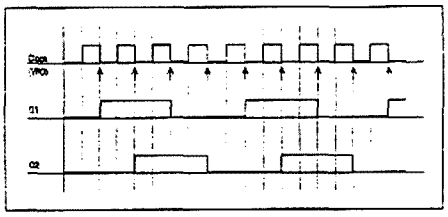


Figure 4 Timing Diagram 7474.

This circuit is noncritical and will operate at any frequency up to the limit of operation of the flip flops. If fast 74ACT series devices are used in the quadrature circuit the maximum frequency directly obtainable from the circuit is about 40 MHz, for a clock running at 160 MHz. The VFO input must be conditioned to be at TTL level for feeding to the 7474.

It is difficult to quantify the phase error of this circuit but it seems likely that it would depend on differences in propagation delay in the two flip flops.

Audio Phase Shift Network

A 90 degree phase shift can be produced over a decade audio bandwidth using all pass networks fabricated with passive components or op amps. However to realize acceptable phase error they require close tolerance components with non standard values.

The Polyphase network was described in the 1970s as an alternative to these critical networks. It is a new class of network with the unwanted sideband actually being cancelled in the network. See fig 5.

The circuit requires 4 inputs at 90 degrees phase spacing. ie 0,90,180,270 degrees. This produces an output at the other end of the network. If the input phases are reversed, ie 270,180,90,0 degrees, the

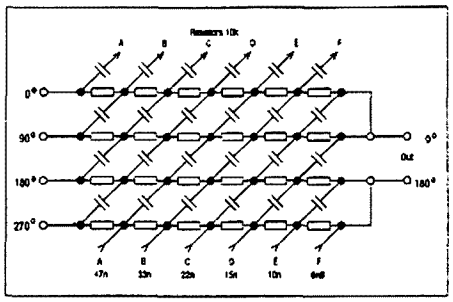


Figure 5 Polyphase Network.

output is zero. This phase reversal happens when the receiver is tuned from one sideband to the other.

The network uses multiple passive components and is very much less sensitive to component tolerances than other circuits. In fact I have used 1% resistors as they are relatively cheap, but 10% tolerance Greencaps. I have performed an analysis of this circuit using a circuit simulation computer program. Varying one component by 10% in each section degraded sideband suppression to approximately 35db. Load impedance does not appear to be critical as far as sideband suppression is concerned though it does affect output voltage. The theoretical maximum sideband suppression is about 80dB at 1 kHz but this drops to about 50 dB at the band edges of 300 Hz and 3 kHz. In practice results will not be as good as this due to component tolerances and phase and amplitude errors in other parts of the circuit.

The Third Method

This method is also known as the Weaver circuit. It will work on both transmit and receive but it is easier to understand the principle of the circuit by studying an SSB generator circuit. See fig 6.

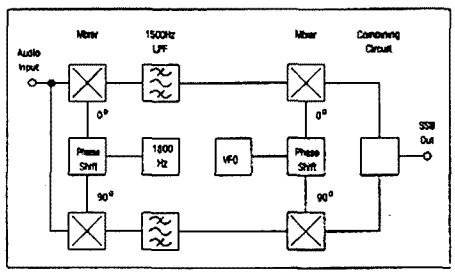


Figure 6 Third Method SSB Generator.

Audio is fed to two mixers which are driven by a subcarrier at 1800 Hz in phase quadrature. The subcarrier has the effect of producing two sets of products; 300 to 3000 Hz + 1800 Hz = 2100 to 4800 Hz and 300 to 3000 Hz — 1800 Hz = 0 to 1500 Hz. The second set of products is the audio signal folded around the 1800 Hz subcarrier. See figure 7. The mixers are followed by a low pass filter with a cut-off at 1500 Hz.

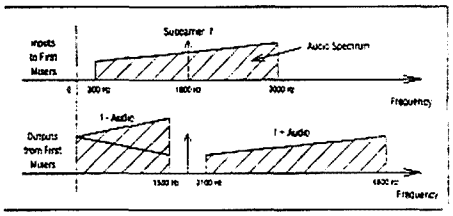


Figure 7 Third Method Audio Spectrum.

This removes one set of products, 2100-4800 Hz, which is in effect one sideband of the final signal. The signals are fed to a second set of mixers with a local oscillator signal in phase quadrature at the signal frequency. When their outputs are combined the resultant signal is single sideband.

To receive using this system the first set of mixers is fed with the local oscillator and the second set with the 1800 Hz subcarrier. When the outputs of the second set of mixers are combined one sideband is cancelled and the original audio is reconstituted.

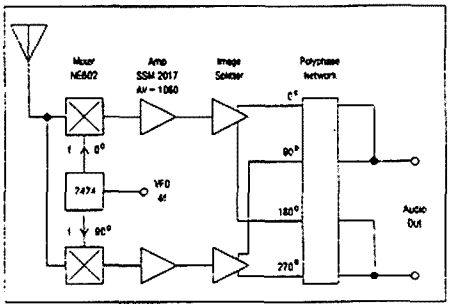


Figure 8 SSB Receiver Front End.

The low pass filters are quite critical as they have to have a sharp cut-off between 1500 Hz and the bottom of the unwanted spectrum at 2100 Hz. A filter of at least 6 poles is probably required.

Switched capacitor IC filters are now available which will give this order of performance in a single package and relatively few components. I have not tried this circuit but it would be relatively easy to realize by substituting the low pass

filters and second set of mixers for the Polyphase network described above.

Mixer design

The goals for mixer design are good strong signal handling, conversion gain, and low noise. Less important considerations are local oscillator drive requirements and circuit simplicity.

Unfortunately these requirements are often conflicting. For example to achieve best strong signal handling in an active mixer it should be run at a high collector current which is not ideal for noise performance. On the lower HF bands noise performance and sensitivity are less important than strong signal handling due to band crowding and high ambient noise levels.

Poor strong signal performance can actually worsen mixer noise performance and dynamic range as the multiple intermodulation products produced by strong signals are heard as hash thus raising the mixer noise floor.

I looked at various devices available as mixers. The ring diode mixer offers good strong signal handling but has a conversion loss of about 7 dB. Thus to get reasonable sensitivity the audio amplifier following the mixer must have exceptional noise performance. For example to achieve 1 μV sensitivity with 10 dB S/N the amplifier would need to have a total equivalent input noise of < 0.1 μV. This is achievable with relatively cheap devices now but microphonics can be a problem. The ring diode mixer requires a local oscillator drive power of about + 7 dBm. Even using TTL circuits in the RF quadrature circuit a buffer amplifier was necessary as the TTL gate was unable to drive the mixer directly. Diode mixers can be fabricated from individual components but this increases complexity and packaged devices are relatively expensive.

Many of the recent published designs for DC receivers have used the NE602 active mixer. This device offers conversion gain and a good noise figure due to an inbuilt RF amplifier and active mixer design. However it does suffer from rather poor strong signal handling with a third order intercept figure of -15 dB. In practice it is possible to overcome this by inserting an attenuator on the lower bands and taking advantage of the device gain on the higher HF bands.

The SL6440 high level mixer from Plessey was considered as a third candidate. It has excellent strong signal handling with a quoted third order intercept figure of +30 dBm. However to achieve this figure it has to run at 25 mA current with an output impedance of 50 Ohms and conversion gain of −1dB. With this high collector current noise performance is relatively poor with a noise figure of 11dB.

The comparisons between the various mixers are summarized in Table 1.

Audio amplifier

The signal at the output of the mixer is in the order of microvolts only. Thus to achieve low noise overall the audio amplifier following the mixer has to have good noise performance. Op amps have high gain but are inherently noisy devices due to the virtual earth effect at the inverting input. Thus it is necessary to use purpose designed amplifiers. The SSM2017 from PMI is quoted as having a noise performance of 750 pV/Root Hz or a total equivalent input noise of about 0.04 μV for an audio bandwidth of 300-3000 Hz. The device can be set up with a gain of up to 1000. It gave good performance in a test receiver with no significant noise contributed by the audio amplifier.

Audio System

To take advantage of the sideband suppression of the Polyphase circuit the audio amplifier following it should have a sharp rolloff above 3 kHz as the sideband suppression of the network falls off rapidly above this frequency. I found that a filter of at least 5 poles was necessary. This can be realized using multiple op amps or one of the more recent IC switched capacitor filters.

I have built a test receiver based on the Polyphase circuit. See fig 8. It gave good results on 3.5 MHz with sideband suppression of about 40 dB and acceptable strong signal handling Sensitivity was more than adequate for the 80 m band and an attenuator was necessary to avoid cross modulation. Subjectively the receiver gave excellent performance. I have not tried the circuit on higher bands.

References

Weaver, D.K. A third method of generation and detection of single sideband signals Proc IRE 44:1703-1705 1956

Intermodulation, phase noise and dynamic range Application note in Plessey Professional Products IC Handbook May 1991.

Hey, J.R. Simple SSB Generator employs Polyphase network using standard components. ETI Aug 1979.

New low power single sideband circuits. Signetics Application Note AN1981.

Table 1 Mixer Comparisons

Mixer	3rd Order Intercept	Gain	Noise Figure	Comment
Ring Diode Mixer SBL-1	+10dbm	−7db	—	Expensive, LO Drive +7dbm
NE602	−15dbm	+15db	4.5db	Relatively Poor Strong Signal
SL6440	+30dbm	−1db	11db	High Current, Expensive

* *56 Lynton Street, Mt Hawthorn WA 6016.*

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad.

An Approach to Weatherproofing RF Connectors

*Richard Cortis VK2XRC * suggests a solution to a universal problem.*

Introduction

The lack of waterproof performance of RF connections and connectors is a primary cause of poor long-term antenna performance. It is intended to look briefly at the defects arising from water entry with a more detailed appraisal of the various low-cost means available to reduce the rate of water intrusion and corrosion at conductor interfaces.

The Problem

Rainwater is not very conductive, but it has an affinity for various materials readily available in our environment which can make the water an effective electrolyte. This is of primary concern for a number of reasons. Firstly, where an electrolyte forms a bridge between two points in an antenna or feedline which are normally insulated from each other the conductivity of the electrolyte will significantly attenuate the received signal and make reception poor. Where coaxial cable gets water in the outer braid, funny things happen to the nominal impedance of the cable, and signals are degraded. Secondly, the longer term presence of moisture can lead to corrosion of RF conducting surfaces which significantly increases losses and degrades received signals. You lose output, too, and the cables get just a bit hotter. If you are a power freak, or if it is a hot sunny day, the heat and the current speed up the corrosion, and the system degrades rapidly. External connections to antennas are particularly prone to electrolytic corrosion which results mainly from the use of incompatible dissimilar metals (copper and aluminium) in an electrolyte of salt spray and industrial pollutants. Unsealed ends of coaxial cables allow water to enter around the conductors and corrode the metal surfaces. The end result of these problems is the purchase of a new run of coaxial cable together with the makings of a new antenna.

The Hopeful Approach

The usual approach to weatherproofing external connections is to do nothing and hope for the best. Some use soldered-on tabs and steel screws to connect copper wires to aluminium antennas. In a semi-arid environment, this will produce a reasonable result. The order of the connections in relation to the direction of water flow can have a profound effect on the durability of the connection. Other constructors attempt to exclude the water by covering the assembly with a silicone sealant or waterproof mastic material. The trouble with this approach is that few take the detailed steps necessary to ensure adhesion of the sealant to the substrate metal or plastic. No-one ever uses the recommended primer. So what happens? The sealant does not stick to greases used in the manufacture of metal components or tube stock. Silicone materials won't even stick to finger grease or sweat. Nor do they adhere to corrosion products or dirt, etc. Far from excluding the water with its suspended or dissolved pollutants, the sealants with their built-in poor adhesion normally act only to retain the water (complete with conductivity enhancing salts) on the most sensitive parts of the antenna or feedline for a longer period of time, usually whilst the sun is shining to really get the chemical reaction going. We end up with corrosion at the interface between the faces of the conductors on each side of the connection. When the interface dries out, the corrosion products cease to conduct across the connector, and this resistance can affect significantly more than the nominal impedance characteristics of the feedline at that connector. You do not need much imagination to guess what effect this discontinuity may have on the radio frequency performance of the feedline. You may even get some rectification of an unwanted signal.

How Does the Water Get In?

Attempts to exclude moisture from RF connectors such as the ubiquitous PL259 usually follow the old regime of attempting to seal the outside of the connector with a setting type material. Again this serves only to seal the moisture in, and makes disassembly for inspection most difficult. The usual question is "I wonder where all that water got in? It could not have got in at the connector because I sealed it perfectly. You saw how hard it was to get off!" Ho, hum.

The plain fact is that the water gets in through many routes, including the capillary joints that did not adhere and through defects in the sealant that you wiped on with your finger. When the cable gets hot (it is black and sits in the sun) the gases inside the cable heat up and some escape. If there is any moisture, a portion may vaporise and expand enormously, sometimes expelling air and vapour. Then we get a thunderstorm and it rains on a hot cable. The cable cools and so does the gas, and the vapours condense, significantly reducing the pressure inside the cable. Any rainwater falling on the cable and passing a defect will be sucked in. The same happens when your neighbour hoses your gear while you are at work.

"Silicone materials won't even stick to finger, grease or sweat."

Corrosion proceeds on, in, and around exposed external connections and connectors during and after each rainfall event or dew. The hygroscopic nature of some of the salts deposited from the atmosphere or generated as part of the corrosion process can significantly reduce the relative humidity under which the salts will hydrate and form an electrolyte. The usual concoction of dissimilar metals in any connection of a coaxial cable to an aluminium antenna will normally ensure rapid corrosion. There are a few more problems associated with thermal movements and the introduction of sealants to tubular elements and screw threads.

Most leave a lot to be desired, and the sealant acts as a neat plastic

cover to keep the water in till it has all been consumed in the corrosion process.

So What Can We Do About It?

Firstly, there are a number of matters to be considered. We need to consider the degree of exposure to the elements, including rain and sun as well as airborne pollutants, dust and salt spray. One very reliable way of waterproofing connectors is to leave them out. Don't have any. If you have enough cable and you are reasonably confident that your tuning to date can be repeated, feed the cable straight into the Gamma Match. Don't have a connector. Or you can build your half-wave vertical dipole by trimming a quarter wavelength of braid from the end of the cable and wind a few turns around the mast as a trap to stop the RF going back down the outside of the coaxial cable. No connector, no water leaks and no corrosion and a more durable antenna. There was an article on building an antenna like this in AR magazine some time ago. The marine VHF (156MHz) antenna on my boat is designed on this principle; no connectors and no soldered joints! No hassles!

If you must have a connector there are a number of things you can do, each of which works to some degree, but none of which approaches perfection unless you use a military specification connector device. The most important component is your acceptance that we can only approach excellence with our cheap readily available connectors. So where do we go from here? If you have a connector, it means you have a reason to break the cable at that point. So you want to be able to disassemble the connection for maintenance or further experiment. If you don't have a very good reason to have an exposed connector, give very close and detailed consideration to leaving it out. If it's not there, it can't cause a problem. This approach will limit the amount of actual waterproofing to be carried out to necessary connections and connectors.

Let's accept that we get some water in. Then let's go about accommodating that water and try to minimise the damage it can do. Accordingly, we need to look at reducing corrosion on the accessible conductors that carry the RF. We can coat the accessible metalwork with a material which should be non-hardening and non-hygroscopic and should not transmit oxygen so that the corrosion process is halted, or at least significantly suppressed. This will help ensure the mail gets through. Then all we need to do is to protect the threads so we can undo the connection or connector and to cover the lot with something to kid the water into staying away. Sounds simple? All we have to do is to make it work!

The Witches' Cauldron

There are a multitude of materials on the present-day market which make all sorts of claims as to their effectiveness to solve your problem today. Perhaps, but the material used may create a few more problems for you to solve tomorrow. Accordingly, the selection of the most appropriate material is critical to success. However, detailed preparation and correct use are more important. More than one type of material may satisfy the selection criteria in any given circumstance.

". . . is designed on this principle; no connectors, and no soldered joints! No hassles!

I have attempted to set out below a brief selection of materials for use in electrical connections. Materials ideally should be good dielectrics, should not dry out in the sun, should not be soluble in water, and should be of a satisfactory consistency for application. All hard to find in the handyman bar at your local hardware store.

A family of products is marketed under the trade name "Denso". The material is manufactured in Melbourne and there are sales offices in the various capital cities. These include a primer, filler mastic, greasy reinforced tape and a polythene wrapping tape. These materials are smelly as the solvent of the primer evaporates, unattractive in colour and appearance, suggestive of more unpleasant material in colour and consistency, messy to use, difficult to wash off, but extremely effective in service. Make sure you have a supply of hand cleaner material for when you are finished.

There is another group of silicone grease materials distributed by Dow Corning and marketed through Bearing Service outlets in the Sydney area. Of primary use is the Compound 4, Electrical Insulating Compound. This material is a clear paste with little or no odour, and its primary intended function is as a filler or coating in electrical equipment. The published performance data are impressive. It is also useful as a rubber lubricant, and is reported to be non-toxic. It is useful for drawing cables through conduits and for lubricating plastic parts and a multitude of other uses that may take your fancy. It is also a very good release agent, so don't get even a trace on anything you ever want to paint or glue. The published working temperature range is from −57C to

+240C, which should be satisfactory for most amateur radio RF connector applications. Other materials in the family are Compound 7, which is of lower consistency and is intended as a release agent, and Compound 111, which is of thicker consistency and is intended as a rubber lubricant in "O" rings in tap spindles and a multitude of varied application. I use it to lubricate the WC pump on the boat.

What Do You Use Where?

For many years I have used the Denso primer on coaxial cable connector pins and threads, and to prime the exterior of the connector prior to application of the Densyl Mastic. The exterior is moulded over with Densyl Mastic to fill all the depressions before it is wrapped with the Densyl tape, which is similar to the mastic except that it is reinforced with a cotton fabric about 100mm wide. Various widths are available, but the 50mm and 100mm widths are the most useful for our purpose. There are a number of varieties of each. The obscene resultant lump is then over-wrapped with polythene tape or electrical tape to reduce drying in the sun. Don't forget to tie off the end of the electrical tape with one of those plastic electrical ties to stop the tape unwinding in the wind. I live about 100 metres from the sea, and connections dismantled after five years exposure to the sea-spray were in pristine new condition when opened. Don't forget the hand cleaner at this stage, either.

More recently, I have been using the Dow Corning Compound 4 in the pins and threads of connectors, and coating the exterior of the connector with the Denso materials, as I believe the superior dielectric qualities of the Compound 4 may lead to lower electrical losses. It is simpler to just use the Denso material unless you are very concerned about performance.

For exposed connections, everything in sight is coated with the primer using a 25mm wide paintbrush. Try to overcome the urge to scratch behind your ear. Coat all threads and nuts before bolting it up. Where one aluminium tube is telescoped inside another, you must be sure to clean all mating surfaces of mill oil and dirt etc before coating with the Denso primer. Even the screw threads on the hose clamps should be thoroughly coated during assembly. You will be glad you did when you come to dismantle it, because it will unscrew like it is supposed to without having to resort to the hacksaw.

Please note that although the primer material looks like grease, it is not an effective lubricant.

How Do You Do It?

Firstly, put everything together, tune it and make it work. Mark all critical positions and record all critical dimensions. Then you take it all apart again. Sliding joints between sections of aluminium tube are coated inside and out, all threads are coated and you have a great time covering everything with stuff that looks like something your mother told you that you should never touch. What a mess! Coat everything with primer, even the wing nuts, and make sure there is material between all mating surfaces. Get it right the first time because your mother will not let you play with that awful stuff again! Then take the mastic material and fill in the surface and over the wing nuts, bolt heads and the lot to make a good cover and a nice shape that can be taped over. Don't let anything stick out. Then tape it over and tie off the tape with an electrical tie and go and wash your hands again.

If you do this thoroughly you should have well performing antennas and feedlines for quite a number of years.

Materials Summary

Dow Corning Compound 4
— Electrical Insulating Compound
Denso Primer 300 001 (1 litre)
300 004 (4 litre)
Densyl Mastic 400 003 (3kg)
Densyl Tape 610 050 (50mm wide)
610 010 (100mm wide)

* *4 Victory Street, Clovelly NSW 2031.*

ar

'AWA' 25M — Some Further Thoughts

*Ian Keenan VK3AYK * updates his original article.*

Following my original article covering the conversion of the 'AWA' 25M lowband car phone back in 1988, I am happy to see many of these units seem to be finding their way onto six metres. In Melbourne there seems to be a growing number of happy users appearing on the local repeater — VK3RMS.

However, it has been found after conversion that a small number of these units seem to be beset with problems. This is usually evident in the transmitter. Typical symptoms are white noise and also what sounds like a bad case of flatulence! These problems are usually the result of lack of drive from the transmitter exciter. This can usually be remedied in the exciter by the following changes:

C54 from 3.3pF to 4.7pF
C45 from 3.3pF to about 6.8pF

Better results would probably be obtained by rewinding the coils that are padded with capacitance in the exciter conversion. But, if the above capacitor changes are carried out there should be a big improvement in performance. Remember to take your time when doing the TX alignment. Good luck!

* *6 Pretoria Street, Caulfield South Vic 3162*

ar

What are *you* doing to assist the up-and-coming Hams in your area. Your local high school may need assistance or advice to start a radio club.

VHF/UHF An Expanding World

I regret that due to illness of Eric Jamieson VK5LP, VHF/UHF An Expanding World will not appear this month. We all wish Eric a speedy recovery, and look forward to a resumption of his column when he is feeling better. ... Bill Rice VK3ABP Editor.

AMSAT Australia

Bill Magnusson VK3JT 359 Williamstown Rd Yarraville VIC 3013.
Packet: VK3JT@VK3BBS

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

Amsat Australia net:
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.

AMSAT Australia newsletter and software service:

The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Aust. addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Arsene report:

Well, I thought we would have had some good news by now. As you probably already know the launch was delayed by accidental damage to an antenna on the main ASTRA satellite. Evidently the damage was repairable and did not require replacement of the antenna. Replacement would have meant a delay of some weeks. Maybe next month I'll be able to give you some post launch details.

MIR report:

The current MIR crew have continued to take part in scheduled QSOs with school based stations. I was involved in one recently and it went very well. They are very patient with questions and answers. The contact with St Columba's college in Essendon, Vic. will be written up in detail by Lee VK3PK who conducted the event. A crew change is due next month and one of the new crew members is involved in space education in Russia. Hopefully this means we can look forward to more of this type of activity.

RS-1, an old timer turns up again:

Recent packet radio bulletins indicate that signals have been heard from the old RS-1 satellite. The bulletins originated from Trace Ward ZL2BS. I'm sure Trace wouldn't mind me mentioning it in this column. He has asked for feed-back. The frequency is 29.401 MHz +/– doppler shift and the CW signal includes sequences like "5015". RS-1 was launched in 1978 and it is quite remarkable that it is still transmitting. Although this kep set is a bit out of date you can use it as a guide.

Satellite Name	: RS-1
Satellite ID	: 11084 (1978 — 100A)
Epoc	: 08MAR93 18:53:35
Inclination	: 82.5490
RAAN	: 185.4602
Eccentricity	: 0.00111
Arg. of Per.	: 143.9081
Mean Anomaly	: 107.0001
Drag	: 0.00000008
Mean Motion	: 11.967252
Orbit Rev. No.	: 62777

Listen a few minutes either side of the predicted times and if you hear anything send a report to Trace Ward ZL2BS @ ZL2AB.#46.NPL.NZL.OC. It may be worthwhile listening for some time on either side of the predictions as 29.4 MHz signals from satellites such as this can propagate over long distances, well over the horizon.

AO-13 report:

AO-13 is still giving good long distance QSO opportunities. Chances are that it will continue to do so as the apogee drifts further south. It is at present 37 degrees north latitude and coming south at about 0.05 degrees per day. The perigee height as expected has increased to about 720 km from a low point last year of less than 600 km. Unfortunately it is predicted that this will be its last increase before dropping down to less than 200 km in about 3 years and burning up in the atmosphere.

AO-13 continues to experience eclipses. They won't be so bad until September having a maximum of 24 minutes but will get worse again in December with eclipses of up to 140 minutes. Watch the transponder schedules as these events will greatly affect the switching sequences.

G3RUH program for GEO-STATIONARY satellite look angles:

This program is circulating on the BBSs at present. I can send you a copy on disk if you missed it. As you would expect from James it is accurate, even taking into account the out-of-roundness of the Earth. It is extensively REMed but there are only 35 lines of code so it is easy to type in if that's your only method of entry. The original that I downloaded was missing a colon (:) on line 480 which may cause it to hang up in the execution. After you have LOADed it using GWBASIC, you may have to SAVE it to convert it into GWtalk before you can RUN it. If you pass it on please honour James' request. Pass it on complete and give credit to the author.

Note: Some versions of GW may require PI to be defined at the beginning of the program. If this is the case, put it at the start of line 310.

From : G3RUH @ GB7DDX.#22.GBR.EU

The following BASIC program calculates the position of geostationary satellites:

- In compass bearing (Azimuth) and Elevation.
- In polar mount angles.
- Uses non-spherical Earth.
- Guranteed free of spherical trigonometry and ozone friendly.
- Fully documented.
- Learn; enjoy!
- Sorry about the GOTO.

Remember to leave a three second break between overs when using a repeater.

```
10  REM "B.GEOSAT" Calculates Geostationary Look and Polar Mount Angles
20  REM
30  REM Version 1.3 Last modified 1986 Aug 20 by JRM
40  REM
50  REM (C)1986 James R Miller G3RUH
60  REM
70  REM Free use encouraged, provided credit given to author
80  REM
90  REM Program calculates Range, azimuth and elevation of a satellite
100 REM on the geostationary belt, as well as the settings for a
110 REM polar mount antenna system.
120 REM
130 REM First find the observer's geocentric coordinates and unit vectors
140 REM UP, North and East, once only. Earth is modelled as an oblate
150 REM spheroid, using the IAU-76 parameters.
160 REM
170 REM Next you are asked for the Satellite's Equator longitude in
180 REM degrees, positive values EAST, negative values WEST. Then its
190 REM geocentric coordinates are found.
200 REM
210 REM Next the observer's vector is subtracted to give range vector,
220 REM and resolved into components UP, East and North, whence AZ and El.
230 REM Polar mount settings are found by resolving Range onto the local
240 REM equatorial plane.
250 REM
260 REM NOTE: Geocentric coordinate system is right handed XYZ, origin at
270 REM the Earth's centre. X and Y axes lie in the Equatorial plane
280 REM with X pointing towards Lat=0, Lon=0, the Y axis pointing to
290 REM Lat=0, Lon=90 East, and the Z axis pointing to the North pole
300 REM
310 RD=180/PI: DR=1/RD: REM PI= 3.141592654 .... Conversion factors
320 :
330 INPUT"ENTER Lat, Long, Height ASL (+N deg, +E deg, metres) ";LAT,LON,HT
340 :
350 LAT = DR*LAT: LON = DR*LON: HT=HT/1000: REM Convert to radians etc
360 CL = COS(LAT): SL = SIN(LAT): CO = COS(LON): SO = SIN(LON)
370 RE = 6378.140: FL = 1/298.257: REM Earth Shape, IAU-76 data
380 RP = RE*(1-FL): RE2 = RE*RE: RP2 = RP*RP
390 D = SQR(RE2*CL*CL+RP2*SL*SL): RX = RE2/D + HT: RZ = RP2/D + HT
400 REM Calculate Observer's unit vectors Up, East, North
410 UX = CL*CO: UY= CL*SO: UZ=SL
420 EX = -SO: EY= CO: EZ=0
430 NX = -SL*CO: NY=-SL*SO: NZ=CL
440 REM Calculate Observer's geocentric coordinates
450 OX = RX*UX: OY = RX*UY: OZ = RZ*UZ
460 :
470 A = 42164: REM Geosat Orbit radius, km. Constants all set up now.
480 :
490 REM + + + + + + + + PROGRAM LOOPS FROM HERE ONWARDS + + + + + + +
500 REM                 ----------------------------------------------
510 INPUT"ENTER Geosat's Longitude, deg (+East, -West) "; SLON
520 :
530 SX=A*COS(SLON*DR): SY=A*SIN(SLON*DR): SZ=0: REM Satellite's vector
540 RX=SX-OX: RY=SY-OY: RZ=SZ-OZ:  REM Range vector = SAT — OBS
550 R = SQR(RX*RX+RY*RY+RZ*RZ):    REM Range magnitude
560 U = RX*UX+RY*UY+RZ*UZ:         REM Resolve Up
570 E = RX*EX+RY*EY+RZ*EZ:         REM East
580 N = RX*NX+RY*NY+RZ*NZ:         REM North
590 :
600 EL = RD*ATN(U/SQR(E*E+N*N)):   REM and compute Elevation, Azimuth
610 AZ = RD*ATN(E/N)
620 IF N < 0 THEN AZ=AZ+180:       REM Sort out azimuth quadrant
630 IF AZ < 0 THEN AZ=AZ+360
640 :
650 REM Resolve Range vector to local Equatorial plane.
660 X = RX*CO + RY*SO
```

```
670 Y = -RX*SO + RY*CO
680 Z = RZ
690 INCL = RD*ATN( Z/(SQR(X*X+Y*Y)) ):REM Polar mount inclination
700 SLEW = RD*ATN( ABS(Y/X) ):          REM and slew angle
710 D$="E": IF Y < 0 THEN D$="W":   REM Show direction in
720 H$="N": IF Z < 0 THEN H$="S":   REM N S E W terms.
730 D$=D$+" of "+H$
740 :
750 PRINT"Range ";R;" km"
760 PRINT"LOOKING ANGLES : ";"Elevation ";EL,"Azimuth ";AZ
770 PRINT"POLAR MOUNT ANGLES: ";"Inclination ";INCL,"Slew ";SLEW;" ";D$
780 PRINT
790 GOTO 490
```

Example for ASTRA (13 East) from Cambridge, UK (N52.0, E 1.0 deg, 100m ASL:
RUN
ENTER Lat, Long, Height ASL (+N deg, +E deg, metres) ?52.0, 1.0 , 100
ENTER Geosat's Longitude, deg (+East, −West) ? 13
Range 38648.8655 km
LOOKING ANGLES : Elevation 29.4913274 Azimuth 164.895202
POLAR MOUNT ANGLES: Inclination -7.43749539 Slew 13.2232479 E of S
73 de James G3RUH @ GB7DDX.#22.GBR.EU 1993 Apr 12 [Mon] 0836 utc

Next month: Updating kep elements in your tracking program.

ar

Book Review
The VHF/UHF DX BOOK

Bob Tait VK3UI

This excellent publication (from DIR Publishing) has 12 chapters crammed full of information on how to become a successful DXer, getting the best out of your equipment , measuring performance and equipment to build.

It is written in a very practical way to explain the mysteries of propagation, predicting the best operating periods, planning schedules etc.

Subjects covered are Meteor scatter, moon bounce, ducting, auroral operations, E's and F's, how to recognise the various modes. Plan your operations to become a successful DXer.

Ian White deals with the business end on how to get the best out of your equipment describing in detail losses, gains, equipment noise, noise temperatures, antenna noise and how to measure all of these factors. In the next chapter he covers receivers, oscillators, intermodulation problems, front ends and what is best for DX.

John Nelson GW4FRX explains how to generate a clean high power signal and coexist with the neighbours. He deals with the subject of amplifiers very well telling you what tubes to use for SSB operation and what tubes not to use. It is all related to the tube's internal capacitance and biasing. John explains commissioning the whole thing without going bang in the night.

He describes how to build a full gallon on 144 using 4CX tubes; there are lots of pictures and diagrams to assist you in construction.

Gunter Hoch DL6WU who is well known for his Yagi designs tells us how to design and construct arrays for all bands from 50 MHz upwards to 432 MHz.

He covers feeder systems, matching, and gives the reader lots of practical ideas and suggestions on how to get practical gain and directivity out of an antenna system.

G4DDK describes how to construct and operate transverters and there are PCB layouts, circuits, tune up procedure, interfacing controllers, power supplies.

There is an excellent section which deals solely with power supplies, screen regulation, filament regulators, grid biasing and much more.

Chapter 11 is devoted to alarm and control circuitry for your linear or transverter, it even features an RX/TX sequencer. "What is this?" you may ask. Buy the book and find out about it, build the unit and impress your friends.

At the end of this well laid out book there is a section on test equipment and station accessories. Have you ever wanted a speed controller for your rotator? Well there is a circuit for you to build, as well as a pip tone generator, 2 tone generator, filters, watt meters both RMS and PEP, various VSWR bridges, RF voltmeter. There is even a TDR, and lots more.

I recommend this book to you as most of this information is new and not the same old stuff recycled. It will become a useful addition to any keen VHF/UHF DXer.

ar

WIA News

New Federal President & Vice President

Kevin Olds, VK1OK, was elected Federal President of the WIA at the Annual Federal Convention, held over the weekend of 1-2 May, in Melbourne.

Kevin has served as Federal Councillor for the ACT Division and on the previous Federal Executive, as well as currently acting in the position of IARU Region III representative. Packet enthusiasts will readily recognise Kevin's callsign.

Neil Penfold, VK6NE, was elected unopposed to the position of Federal Vice President. Neil has served as WA Division Federal Councillor for some 20 years and is QSL Manager for VK9 and VK0. Neil is well-known among the DX fraternity.

Repeater Link

* Will McGhie VK6UU @ VK6BBS

You may remember a long article a couple of months back about an intermittent fault on a UHF repeater, VK6RUF. The fault took considerable time to find as it was intermittent and only occurred between a narrow range from 52 to 54 degrees.

Much to my annoyance the repeater went dead again. Investigation found low transmitter output, but this time the fault was mechanical and not temperature related. The fault was located in the same area as before, the exciter multiplier stage. Touching a multiplier coil would bring the fault on and off.

The coil was removed for inspection and re-soldered back into circuit, as no obvious fault was found. While the board was out all soldered joints were re-soldered. The exciter stage was given a re-tune and returned to service.

With no fault found there is little satisfaction in this outcome.

Intermittent faults are the worst type of fault. When the fault can not be found or forced to occur there is one thing for sure, it will happen again.

With the repeater back in service time will be the only test. If this fault returns then the next step is to replace the exciter stage completely.

Reliability in your repeater design should be the top priority as it will result in savings of time and money over a long period. If you are tempted to do it on the cheap the end result will cost you more. I will endeavour to keep you informed as to the outcome of VK6RUF, our UHF voice repeater. The repeater has given many years of trouble free service but at the moment it has developed faults that are hard to find.

Waiting

After all the effort to see a change in the regulations relating to repeaters, we are still waiting to benefit from these efforts. All parties agreed on the changes in their draft form over a year ago, and still we are waiting for them to become law.

Repeater regulations as they are prohibit innovative ideas. Unless your repeater or link fitted the regulations, then it was illegal. The refreshing change by the law makers, removed all this regulation and allowed the technology to move.

Unfortunately there has been a long delay in seeing these changes come about.

What is causing the delay is only rumoured, and all sorts of deadlines come and go with no clear explanation as to what is the problem.

My reluctance in commenting on this delay is the assumption that it can't be much longer. Even if the new repeater regulations are law by the time you read this, the point is worth making, why have the Amateur population not been kept better informed?

Information like "The minister is to make a statement on the new regs" boiled down to just a rehash of what we already knew, with no time table as to when. Further statements like "Senior Management staff are now looking at the amateur regulations and it is planned to see changes within two months" came and went, with no changes.

All these comments came from high up the tree but to no avail. It appears that amateurs have become involved in government policy and the end result, big delays. Perhaps we should count ourselves lucky that it is not a microwave licence for pay TV we are waiting for.

The rumour that is current is that it is all tied up with the new Radcom Act. Once this becomes law our new regulations will be part of the whole package. Also rumoured is the date for the introduction of the Radcom Act to be July first. The introduction of this new communication bill is no doubt complex and requires time, but why not let the Amateur know what is going on?

It seems as if all amateur input and criticism to the delay has given up.

Jumping up and down becomes tiresome and you go off and do something else that has results.

If the new regulations are what we saw in the draft copy then they will have been worth waiting for and are a credit to all who put them together, but information along the way as to why the delay would have been appreciated.

By the time you read this I hope it is now irrelevant and the new regulations are law, particularly the ones relating to repeaters. These thoughts are mine and probably lack understanding of what is going on, but in the light of little information it is the best I can do.

Repeaters — additions, deletions, alterations. Have you advised the WIA of changes needed to the repeater list.

Feedback

Since starting this column over two years ago, I have enjoyed the feedback from readers who are building or have built repeaters. It is interesting to note that most of the feedback is from the more isolated areas of Australia.

The capital city repeaters are probably built and maintained by amateurs who have easy access to information, parts, equipment and expertise.

This is what I wanted to start, a focus and a source of simple information on repeaters. To many amateurs putting a repeater on air is simple, particularly if you do it for a living. However for some amateurs setting up a repeater can be a daunting task. It may look easy, but in many cases it is not. A repeater is not just a piece of radio equipment. There are many other aspects that require considerable effort.

Often the most difficult is finding a secure site with power. This problem alone can stop a new repeater before it has even started. Then there is access and security, along with how long is the site likely to remain available. Reliability of the equipment, and have you made a good choice in the type of equipment, are always in doubt. Many of these issues are overwhelming.

What started out as a "let's put a repeater on air" has turned into problem after problem, with delays that at the start would have been laughed at. One repeater in VK6 took 10 years from "let's put a repeater on air" to seeing the service provided.

This is what these words have tried in a small way to help. There is no infrastructure in Australia for repeater builders to find out what they want to know to make the job achievable. It has been said many times "as communicators we don't communicate". It is important for those amateurs new to installing a repeater, or lacking a source of information, to have somewhere to direct a question or two.

Looking through all the queries I have received over the past 2 years, the duplexer and repeater control system are among the most prevalent.

Next month's Repeater Link will be for all those contemplating, for the first time, to put a repeater on air, and having little more than enthusiasm.

* 21 Waterloo Cr Lesmurdie 6076

ar

How's DX!

*Stephen Pall VK2PS **

Some of the "armchair DXers" have the game sewn up. They join nets and lists, leaning heavily — sometimes — on the generous assistance of the net controllers.

Having the report counted to them three times by the DX station, and often just guessing it, they are proud of their achievements, because somebody just said the magic words: good contact.

The same DXers are also good complainers: "The DXpeditions always want donations." One often hears that the propagation is manipulated towards "green stamp" countries. The DXpeditioner is a "mean" fellow for not granting individual favours to move to a specific frequency. "They do not QSL via the Bureau", "They want SASEs for direct QSLing", and so it goes on. The list of complaints is almost endless.

Some of these armchair DXers never think of the expeditioners as ordinary human beings, as hard-working highly stressed and tired operators often deprived of food, sleep or proper accommodation. The armchair DXer seldom regards his counterpart on a tiny speck of sand in the middle of the Pacific Ocean as a volunteer who provides the opportunity for him to work that rare DX country.

A detailed story of the Howland Island (AH1A) and the Kingman Reef/Palmyra (KH5) activity, which appeared in various DX magazines, illustrates the extreme difficulties and sometime life-threatening situations facing the individual amateurs on these undertakings.

Penguin Island — ZS1, Walvis Bay — ZS9

James DJ0WQ, Peter DJ2ZS, Roland DJ4LK and Gunter DK2WH are planning to be active from Penguin Islands (IOTA AF-055) from 25 July to 3 August. They may take two antenna masts with them and also an amplifier. Later, in the second part of August, they will be in Walvis Bay and Namibia. The intention is to work on all bands, 160-10m, both in CW and SSB.

Uganda — 5X

The Ugandan Post and Telecommunications Corporation advised the Geneva ITU authorities on 4 March that the ban on amateur radio activity has been lifted.

Provided there is a valid home licence and valid operator's certificate, the visiting amateur will be issued with a letter of authority to operate during the Ugandan stay.

Residents of Uganda will receive a single-letter suffix, whilst visitors will receive a two-letter suffix starting with X. Bruno 5X1A (QSL to Box 3316, Kampala, Uganda) and Jim 5X1B (QSL to Jim H Brandenburg, American Embassy, Kampala, Dept of State, Washington DC 20521, USA) continued to be very active.

Early in May two more visiting amateurs appeared on the bands: Jim 5X1XX (QSL to K7UP John A Schneider, 9220 Corona Rd, Las Cruces, NM 88001, and Paul 5X1XT (QSL to WF5T Paul Rubinfeld, PO Box 49091, Santa Fe, NM 87502, USA). Quite a number of VKs were able to contact them on 21205 and 14222 kHz.

Libya — 5A and Tunisia — 3V

April has passed, and the proposed activity by Romeo 3W3RR is still in limbo. DX bulletins carried the news that Romeo was sick in Cairo for several weeks. Other sources said he will attend the Dayton Hamfest. There were rumours again that the expedition will take part only if enough funds are donated. Some DX outlets indicated that the activity will be split into two parts, with operators from Spain and Belgium joining the Tunisian section. A Polish DX net even announced that Romeo has cancelled the trip altogether.

The latest news is that Romeo, two Bulgarian operators and one Russian will start the activity from Libya at the end of May. The DXpedition is not fully funded yet, but it appears this time there is a real possibility it will take place — at least from Libya. The group will travel from Egypt by jeep to Damah on the Mediterranean Sea. QSL cards will be posted from Bulgaria. Cross your fingers and hope for the best.

Peter I Island — 3Y

If you missed the Bouget activity some years ago, early 1994 will give you the opportunity to try to work Peter I Island, which is a separate DXCC country in the southeast Pacific Basin in the Bellinghausen Sea, 68.8 South — 90.6 West. Most of the former South Sandwich DXpedition members are preparing already for this activity. An international team of 10 operators, with four HF stations operating in all modes and on all bands, plans to stay on the island for 16 days.

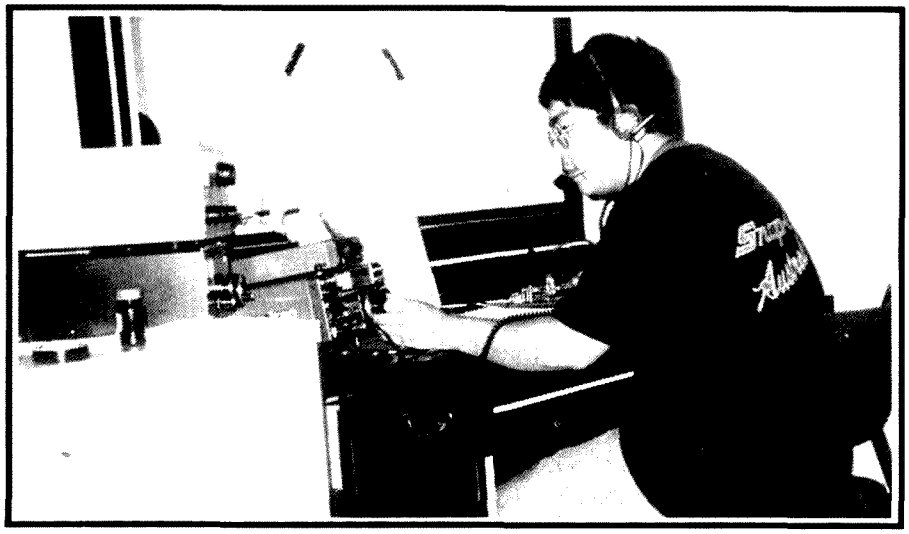
As is already customary with big DXpeditions like this, funds are urgently required to make this project happen. AA6BB and KA6V will accept contributions.

New DX Countries

As expected, the ARRL Awards Committee voted to accept the recommendations of the DX Advisory Committee (DXAC) to add Macedonia (former Yugoslav republic: 4N5, YU5) for contacts made after 8 September 1991 to the list of DX countries. The awards committee also decided to delete Czechoslovakia (OK-OM) effective 1 January 1993, and replace it from that date with the Czech Republic (OK, OL) and the Slovak Republic (OM). QSL cards for these three new countries should be sent to the ARRL DX Desk after 1 June 1993. The total number of current DXCC countries is now 327. There are 56 deleted countries.

Future DX Activity

- There is a new station on air on Tarawa Atoll, Kiribati. The operator is Father Karl, a Catholic priest with the callsign T30NJ. Father Karl's last posting was in Senegal where he was active as 6W6NJ. QSL to Fr Karl J Elsener, PO Box 231, Bikenibeu, Tarawa, Republic of Kiribati.



C21/VK2BEX, Atsu working the "Pile up".

- Instead of having a special award this year, the Hervey Bay Amateur Radio Club will activate VK4CHB on a 24-hour basis in the first seven days of August 1993. They will be calling CQ on the 80m DX window, 7100, 14235, 21250, 28495 kHz, and on the Australian novice frequencies. QSL to VK4CHB.
- According to Percy VK4CPA a group of Canadians will be at the magnetic North Pole between 18th and 25th August activating the special callsign CH8MNP
- KB0EBH will operate from the island of St Lucia, Caribbean, in August.
- XT2BW Peter is still very active. After four-and-a-half years of duty, he finishes up in December 1993. He is the only resident amateur in Burkina Faso, so make sure you work him before he leaves. QSL to WB2YQH.
- Look out for Bahrain, A92WH and/or A92C. The operator, Volker DL1WH, will be there until the end of June. QSL to his home call.
- San Felix XQOX is still very active; the operator is John on SSB.
- HB9AMO/OD5 is in Lebanon for three months.
- There is still no news about the proposed Spratly Island activity. Some well placed DX sources say that the activity is imminent, with only one more signature necessary on the paperwork.
- Canadian amateurs use quite a number of special prefixes in the April-June period, celebrating various anniversaries. The following prefixes were heard: VB1-8, VO3-VO4, VY7-VY8, XJ4.
- EL2YD is Yannick F6FYD until December 1993.
- C9OAB is John G4ZQM, and he is likely to be there for a lengthy time. QSL to John Neary, PO Box 42, Nacala, Mozambique, Africa.
- An all YL Dxpedition will visit St Pierre and Miquelon Islands FP — from 17-24 June.

Interesting QSOs and QSL Information

- J52AG-Erik-10110-CW-2145-Apr. QSL to SM0AGD Erik Sjolund, Ormbergsv 17, S-19300, Sigtuna, Sweden.
- ET3DX-28495-SSB-0805-April. QSL to JH1AJT Yasuo "Zorro" Miyazawa, PO Box 8, Asahi-Ku, Yokohama, Japan 241.
- XT2BW-14032-CW-0700-March. QSL to WB2YQH Robert E Nadolny, 135 Wetherstone Dr, West Seneca, NY. 14224-2540.
- Z21HS-14003-CW-0600-March. QSL to The Manager, PO Box 4110, Harare, Zimbabwe.
- VP2VE-Lee-14226-SSB-1236-Apr. QSL to WA2NHA Howard Messing, 90 Nellis Drive, Wayne, New Jersey 07470, USA.
- 4K0/UA3DJG-Nick-14226-SSB-1128-Apr. QSL to The Manager, Box 98, Ramenskoe 140103, Russia.
- C9LCK/P-Franco-14260-SSB-0520-Apr. QSL to I4LCK Franco Armenghi, via Jussi 9, I-40068, San Lazzaro, Bologna, Italy.
- 4N4CX-14157-SSB-0638-Apr. QSL to WA4WTG R Robert Kaplan, 718 SE, 3rd Lane, Dania, FL 33004, USA.
- C31HK-Fred-14243-SSB-0719-May. QSL to Fred Olte, Cortal Comabella, Sant Julia de Loria, Andorra.
- FT4WD-Christian-21205-SSB-0518-May. QSL to F6AXX Norbert Laurent, 72 Chemin de Bellevue, F 83500, La Seyne Sur Mer, France.
- 6V1A-Ouzin-14265-SSB-0617-May. QSL to The manager, Box 971, Dakar, Senegal, Africa.
- A22EX-21205-SSB-0623-May. QSL to N4CID Thomas F Wood, PO Box 116, Dunn, NC 28334.

From Here and There and Everywhere

- Atsu VK2BEX had a successful stay on Nauru as C21/VK2BEX. His first QSO was at 0430 UTC on 14 April, and the last one at 1202 UTC on 23 April 1993. Altogether he made about 10500 QSOs, out of which 140 contacts were on 160 metres, 1100 on 80 metres, and there were also 550 RTTY QSOs.

  Atsu made a short visit to Tarawa Island (T30) and had 850 contacts with the special callsign of T30D. Atsu is a relative newcomer to the DXing world. He started his DXing trips in April 1992 as FW/VK2BEX, operated in June 1992 in Fiji as 3D2BX and in October 1992 as operator with the VK9WW DXpedition on Willis Island. He is also part of the proposed Mellish expedition in September 1993.
- Jack T30JH advises me that he has run out of QSL cards. He is expecting a new supply soon and will try to overcome the six-week delay in QSLing. Jack is active on HF bands including WARC, and he is also a keen six-metre operator.
- Jim VK4BX, Secretary of the Hervey Bay Amateur Radio Club, still has a limited supply of the 1991 VI4HBW and the 1992 VI4FOW awards, which are magnificent enlarged photographs of humpback whales at play. Five green stamps will secure such an award. A few QSL cards from the club's Fraser Island November 1991 activity (IOTA OC-142) are still available for the price of the return postage. The club intends to close the logbooks at the end of the year. If you don't want to miss out, contact HBARC, PO Box 829, Hervey Bay, Qld 4655.
- Sid VK2DID reports he worked Demetrio LU3XPM (54 deg 38'S and 68 deg 50'W) just a few miles north of Cape Horn. QSL to Demetrio Luizon, Ave Malvinas A240, 9410 Ushuaia, TF, Argentina.
- Ken VK3TL, the honorary curator of the WIA QSL collection, advises me that he has now arranged a QSL exchange program with the Austrian QSL collection. (See AR Feb 1993). Ken is looking for unwanted QSL card donations from VK and ZL. His address: Ken Matchett, 4 Sunrise Hill Rd, Montrose, Vic 3765.
- It is well known that the World Callbook is at least one year "behind" with newly issued callsigns. The delay is caused mostly by the infrequent periodical submission of new callsigns by the telecommunication authorities of various governments. Not so with the Germans, known for their efficiency. The East German callsigns disappeared gradually towards the end of 1992. However, all the former East German amateurs are already listed in the 1993 Callbook under the series DL1 to DL0.
- Ian A92BW, the A9 QSL manager, has retired. Cards to A9 should be now sent to Arab QSL Bureau, Box 22381, Muharraq, Bahrain.
- Some further documentation is needed before P5RS7, the North Korean activity is accepted for DXCC purposes.
- Jakob HB9TL is touring the Pacific during May and June. He plans to be in the Solomon Islands, Vanuatu, Tonga, Western and American Samoa, and as P29TL, 3D2TL, FW/HB9TL on the HF bands, including WARC.
- The Ghana 9G1AA activity produced over 30,000 QSOs. Former Ghanaian amateurs have been told to retrieve their previously confiscated equipment. This augurs well for increased activity from this much sought-after DX country.
- Ron ZL1AMO (Ron Wright, 28 Chorley Ave, Massey, Henderson, Auckland 1208, NSW) showed up in Western Samoa as 5W1CW from around 15-21 April and proceeded to Tokelau Islands on 24 April where he was active for four days as ZK3RW. QSL to his home call with SASE.
- DJ9ZB reports that during the recent six days operation as ET3D and as 9E2A, he and JH1AJT made 11,000 QSOs with 141 countries. QSLs to respective home calls.

- Bernhard DL2GAC (Bernhard Stefan, Aachstr 25, D-7772, Uhldingen-Muehlhofen 1, Germany) has concluded his "tour of duty" in the Pacific area, activating many islands for the IOTA program.
- One does not hear much of Monk Apollo SV2ASP/P these days. He has not been on air for the past 15 months since his disagreement with the DXCC Desk about the alleged "incorrect" operation of DJ6SI from Mt Athos. Some DX sources say that Monk Apollo is a keen listener on the bands, and he was heard from time to time saying "good morning" in Greek to his closest friends without concluding a proper QSO.

"Still no news about the proposed Spratly Island activity."

- I would be glad to receive some information from any of our VK/ZL readers whether they ever received the Pitcairn Bicentennial Award from the "award manager" K6ICS who promised these by the end of 1989?
- Pete N0AFW, who took part in the Kingman Reef and Palmyra Island operation, said the real reason for shortening their activity was not the personal injuries and heavy rain, as reported earlier, but the unexpected delays causing a loss of five operating days due to lack of transportation and lack of power generators. These two factors were beyond their control. The boat "Machias" was late returning from the AH1A activity, and a hurricane which hit one of the Hawaiian islands caused a severe shortage in mobile power generators. N9NS/KH5 was active for four days and 15-1/2 hours (11-15 March) and made about 23,500 contacts. N0AFW/KH5 was active for three days and 14 hours (13-16 March) and made around 8800 contacts.

QSLs Received

F6BLQ/D2 (9w mgr F6ELE) HC8A (3w mgr WV7Y) ZP500Y (5w mgr ZP5JCY) 9K2GS (6w op) CO20M (10w op) PZ1EL (5w op) VS6FL (2w op) 9A4AA (3w op) PY0TSN (4m mgr PY3ASN).

Thank You

Thanks to all who keep me informed. In particular, special thanks to: VK2BEX, VK2DID, VK2MMR, VK2KFU, VK3DD, VK4BX, VK4CHB, VK4CPA, VK4DA, VK5FV, VK5WO, VK6RO, VK8AV, T30JH, and the following publications: QRZ DX, The DX Bulletin, and the DX News Sheet.

Good DX and 73

* *PO Box 93, DURAL 2158*

ar

Over to You — Member's Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Feedback

Reference your request for comments on AR.

I think AR is a very good magazine, professionally produced and distributed.

The balance between technical and human-interest content is right, and is not easy to define as it always depends on the contributions received.

I found the printing of the WIA Federal 1992 Annual Reports rather tiresome to read, owing to the small size of the type used. I think such important reports should be printed in larger type.

Why not shout from the rooftops in large print that the financial report showed a profit rather than a deficit, as seems to be the habit of Australian treasurers these days.

I know there are problems in achieving such an aim, eg more pages, cost etc, but maybe other items could be shuffled to the small-print pages instead.

I have been fiddling around with AR computer programs, and maybe the following points — if included in future issues of AR — may be useful:

a: The writer of the program to state which machine/model it was run on and which language/dialogue was used.

b: Printed read-out of program should be used instead of transcription, or if transcribed, checked before used.

c: Probably the best plan is to ask the contributor to provide the discs on request, provided machine, language dialect are stated.

Regards

Quintin Foster
L30720
77 Church St
BEAUMARIS 3193

Border Co-operation — Amateur Radio Exposed

An audience of 70 or so Murwillumbah citizens witnessed a real "Hams in Action" session and an antique radio display at the opening of the Murwillumbah Museum Radio Display.

The museum is funded by the Tweed Shire Council and is administered by the Tweed River Historical Society under the chairmanship of Ron Johanson.

The committee decided, upon persuasion from one of its prominent members, Norm Smith VK2AYU, to allocate space for the donations of old-time radios it had received.

Norm recruited Kev Dickson VK4IW as his right-hand helper. He says he had the misfortune to try to teach Kev the three Rs, and to build crystal sets, back in 1938 at his little one-room school in the backwoods of the Tweed. The crystal sets won!

After much hard work, a respectable display, including lots of wartime equipment, was mounted. The committee was so impressed it decided to have an official opening, and invited the president of the Tweed Shire Council, Max Boyd, and its citizens, on 18 February 1993.

A Kenwood 520 had been donated from the deceased estate of VK2XC Jack, so Norm and Kev got a licence to operate with the callsign VK2DMM. This led us to invite hams to participate in the opening as well, per medium of the magic of amateur radio on a frequency of 7215 kHz.

With loudspeakers rigged so the assembled audience could hear, and a microphone mounted on a tall stand in front of them, Kev VK4IW called in about 10 amateurs one at a time.

The audience heard each amateur respond with their name, their location and that they were standing by for the official speech.

Max Boyd made a magnificent address to the assembled citizens which went over VK2DMM to the listening amateurs as well. He listed the names of all those amateurs, silent key and current, as well as others who had donated to the display.

He also gave thanks to those with technical ability who gave their time to help Norm and Kev get gear operating.

In concluding, a novel way of moving and seconding a vote of thanks to the official speaker was done over amateur radio by Chress VK4AK and Mary VK4MEM, which impressed all those assembled.

In a practical way amateur radio was EXPOSED.

Kevin Dickson VK4IW
49 Rutledge St
COOLANGATTA 4225

ar

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX183	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1988	BX259	$104.00
Easy Up Antennas	MFJ38	$39.25
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX182	$18.00
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX026	$49.00
Practical Wire Antennas — RSGB	BX296	$28.00
Reflections — Software 5 inch disk	BX358	$20.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$6.60
Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$6.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$6.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX264	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BATC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$49.95
Radio Call Book North America 1993	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley QTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX266	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX367	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX196	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1976	BX263	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BX186	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$18.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1966	BX262	$79.90
Radio Auroras — RSGB	BX381	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Coda — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$18.00
Morse Coda Tapes Set 1: 5-10 WPM — ARRL	BX331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX388	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$36.00
DXOC Companion — How to Work Your First 100	BX345	$12.00
DXOC Country Listing — ARRL	BX386	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX396	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldsre	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$36.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$6.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$16.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX166	$36.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BX167	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX168	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX446	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX365	$40.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX288	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$48.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Car Bumper Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

Divisional Notes

Forward Bias — News from the ACT Division

Chris Davis VK1DO

Approximately 50 members of the ACT division have filled in the survey of members' services which was finalised early in May. An overwhelming number of members have voted in favour of moving our broadcast times to be principally originating on a Monday night, with a repeat on just the 2m band one or two nights later.

The spread of preferred frequencies held two metres as the most popular, with 80 metres followed by 70 centimetres as a listed preferences by a few in addition to two metres. It is intended to move our broadcast time commencing on the first Monday in June with 3.570, 146.95 and 438.525 MHz at 8pm local time. A repeat of the broadcast will take place on the Wednesday following. Please note that in the case of the fourth Monday, when members are involved at a monthly meeting, there will be no broadcast on the Monday, only a 146.95 MHz broadcast on the following Wednesday.

Opinions on the role of the office were quite varied, with many local members admitting they did not have an opinion either way. Many voted in favour of us continuing with the office providing greater use is made of it both by members and in terms of increased facilities.

Some positive reactions were received in response to the invitation to be involved in scripting, reading and engineering our local broadcasts, with some very positive feedback and constructive criticism. As soon as is practicable, the roster of personnel involved in all areas of the weekly broadcast will be steadily increased.

The general consensus in relation to book sales etc recognised that we could not continue to subsidise such high stock; however, an order-only basis was favoured, perhaps with some increased emphasis on technical stocks which could not be accessed elsewhere. In view of the intention to retain the office, the inclusion of some range of parts, kits or the like might be a compatible service to refine in response to member demand.

Although the great majority of members favoured both the retention of the office and the continuation of promotional activities, the actual expressions of willingness to help still falls to the same handful. It is an endemic phenomenon in all organisations that a handful do the majority. However, I must say on behalf of those who pitch in that we do enjoy ourselves and look forward to having others participate and share in the fun! We simply don't want to seem selfish!

Our June meeting will be totally occupied by a tour of the transmitter and studios of radio station 2CC, courtesy of Jim VK2UZ. Members are asked to assemble at the station in Bellingden Rd, Gungahlin, for an 8pm start. Members who normally travel to the Griffin Centre by bus or other means, can rely upon transport from members of the committee who will be meeting in the committee room until approximately 7.30pm, and will be in attendance until about 7.45pm for anyone needing a lift.

We look forward to seeing you at our technical tour.

Christopher Davis

VK2 Notes

Tim Mills VK2ZTM

Coming Events

This month over the holiday weekend the annual Oxley Region ARC Field Day at the new venue of the Wauchope Showground ... The next Divisional exams at Parramatta will be conducted during August ... The next Trash and Treasure is set down for Sunday afternoon 25 July.

Happenings

A new radio club was formed recently in the Parramatta region. They meet at this stage on the first and third Friday evenings by arrangement at Amateur Radio House. Contact details are available from the office. See directory on page 3 for phone numbers.

Input to the next Callbook closes soon. Do you have any updates, callsign changes, corrections etc? Write, fax or call the Divisional Office now. Likewise any corrections to repeater listings, advise now.

In line with current trends, Divisional Council recently reviewed the non-smoking rule within any Divisional building. They reaffirmed the request that no smoking was permitted within any enclosed part of either Divisional property.

A reminder that the Division has VHS copies of most of the lectures on video held by the Federal video library. A list is available from the office, together with borrowing details.

The deadline for these notes occurred prior to the deferred AGM. The meeting report will be included in the next available issue.

5/8 Wave

Rowland Bruce, VK5OU.

The Division held its Annual General Meeting at the Burley Griffin Building in Thebarton on April 27th. There was a total of thirty-five members present when I opened the meeting, standing in for President Bob Allan, VK5BJA, who was unable to attend. This number increased steadily to forty-seven as the evening progressed. Both the President's report and the Treasurer's report will be published in the next issue of the Journal. Maurie VK5EA, presented reports as Secretary and membership secretary and John VK5ZHR, the Intruder Watch report.

The 1993/4 Council is:
Bob Allan, VK5BJA, President.
Maurie Hooper, VK5EA, Secretary.
Bill Wardrop, VK5AWM, Treasurer, ex officio Federal Councillor.
Ian Watson, VK5KIA, ex officio WICEN Director.
Rowland Bruce, VK5OU, ex officio Immediate Past President.
Gary Herden, VK5ZK.
Don Wilton, VK5KDW.
John McKellar, VK5BJM, co-opted.
Phil Pavey, VK5BHN, co-opted.
Grant Willis, VK5ZWI, co-opted.

Several proposed alterations to the Constitution, previously published, were adopted and they also will appear in a future edition of the Journal, together with a reprint of the 1986 changes, which will allow members to update their copies until a new issue is published.

Amateurs have been in the public eye recently. Their presence was commented upon during the TV coverage of the ANZAC Day march, and several helped man the Exhibition station, VI5MIR, the mock-up of the Russian Space Station, including VK5's WC LV AZN ZAI AW and CF and no doubt others of whom I am unaware as yet. Thanks for the work and good publicity.

Finally, this month, welcome to the following new members of the Division. May your association with WIA and radio generally be a long and happy one.
Iain Fraser, VK5ZIF.
Laurie Gill.
Joan Harris.
Al Rechner, VK5EK.
A. Ross, VK5ZRA.
Brenton Zerbe, VK5BZ.
John Cashen, VK5AI
Peter Cockburn, VK5TZX.
Ron Johnson, VK5AKJ. ar

Prevent pirates — make sure you sell your transmitter to a licensed amateur.

QSLs from the WIA Collection

*Ken Matchett VK3TL **

The Senior Service — Part 3 ZC4HMS

Members of the RNARS are scattered all over the globe. There are several stations operating from British bases and ships. For example, VQ9RN (RNARS 665) from Diego Garcia in the Chagos Archipelago operated in June 1986 on Gulf patrol aboard HMS Southampton. Station VS1CH operated from the Royal Navy radio station on Singapore Island. Station ZB1AB was active from HM Dockyard on the George Cross Island, and ZB2BO from HMS Rooke on Gibraltar. A considerable number of navy personnel operate from the UK Sovereign Base on Cyprus. The ZC4HMS QSL shown celebrated 30 years of the Royal Navy 1960-1990.

SL8CKR

Most DXers will be familiar with the specially allocated Swedish station callsign with SK and SL prefixes. These originate from military, air force and naval stations holding amateur radio licenses. The SL8CKR QSL featuring the HMS Carlskrona of the Royal Swedish Navy is such an example.

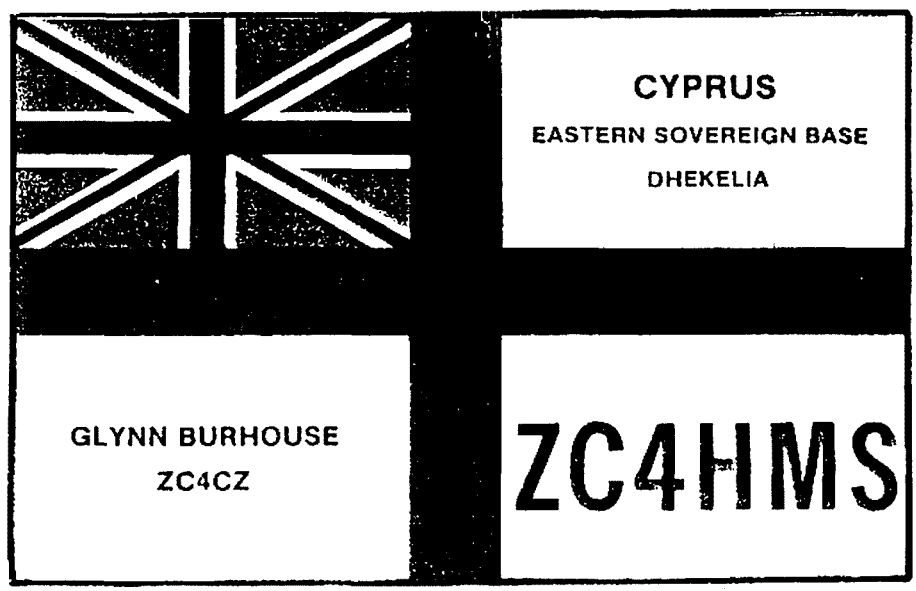
Many other foreign countries issue callsigns (some with special prefixes or suffixes) to naval personnel and establishments. These are mostly radio clubs and maritime schools and colleges. Stations ZL2RN (NZ Branch HQ of the RNARS), LJ2D (Norwegian Naval Club), ON6ZM (HQ station of Public Relations, Belgian Navy), OH1AJ (Finnish Navy Club), PI1ARS (Royal Dutch Navy Club station), F6KSV (French Naval Officers' Club), HC2BEG (Ecuadorian Navy) are but a few examples.

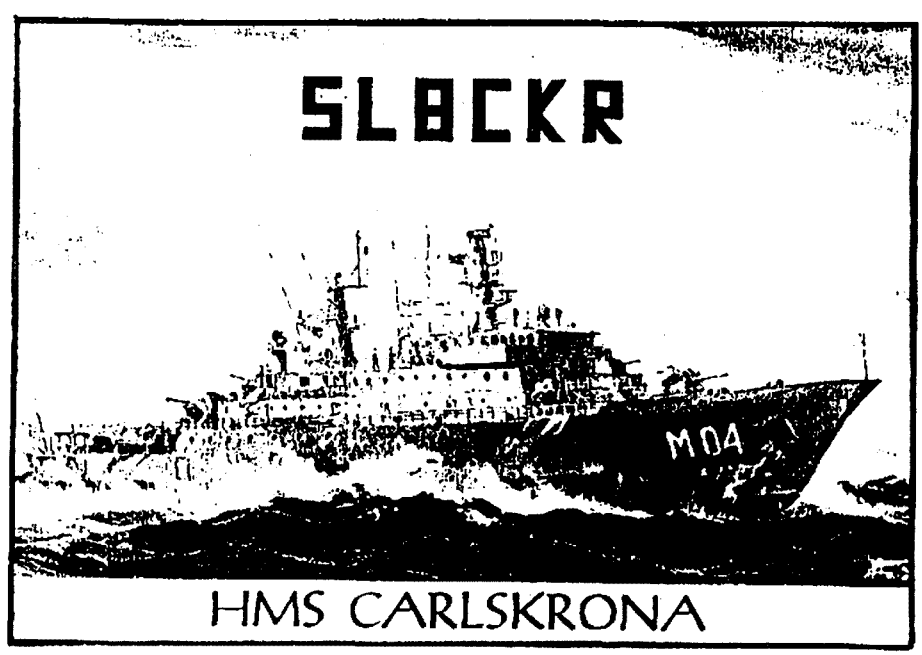
QSLs from the United States have shown a very large number of activities associated with naval forces, and are so numerous that only a short account can be given here. There are especially allocated callsigns of both the US Coast Guard stations and ships identified by the callsign suffix, eg W1CGS, KC4USG. Also there are numerous QSLs from naval bases, naval reserve stations and naval schools. Many are on the US mainland, but several have been sent from overseas countries, many with special callsigns, eg ET3USN Eritrea, JA2MB Marine Barracks, Japan, KZ4USN Panama Canal Zone, KX6USN Marshall Islands, KR6US Okinawa and so on. American naval personnel at Subic Bay naval base in the Philippines, Pearl Harbour, Hawaii, Guantanamo Bay and Antarctic bases and other centres have all indicated their naval interests on their QSL cards. American amateurs have also been most active in maritime mobile operations from a great variety of vessels including Coast Guard cutters, submarines and aircraft carriers.

DL0MF

Several German and Austrian QSLs show their owners to be members of the "Vereinigungnoch Funkender Ehemaliger Marinefunker", a union of marine telegraphists. The training vessel "Gorch Fock", a sailing ship, appears on each QSL card. Like members of the RNARS, each member displays his or her membership number on the QSL. The QSL shown, DL0MF, is that of the club station.

Strangely enough, there are very few QSLs depicting Russian naval activity despite the fact that great deeds of the former USSR are well represented on QSLs from Russian radio amateurs and short-wave listeners. Possibly the only ones that come readily to mind are those showing the Russian battleship Potemkin on those cards which celebrated the 1917 revolution in which the Russian Navy played an important part.





Many readers will be familiar with the special Canadian callsign prefix, VE zero, used for Canadian ships and maritime mobile operations. Most are of attractive design showing ships of various kinds. Amongst these may be found VE0NWC, an anti-sub ship, VE0NEF, a Coast Guard vessel, VE0NWA, a destroyer escort, and VE0MC, a Canadian weather ship.

A number of QSLs from Italy display naval ships of various types. Most are sent by members of INORC (Italian Navy "Old Rhythmers" Club), a club formed by former ship radio officers. Many give details of their war service with the Italian Navy. For example, the operator of station IT9ZNM states he was "Chief Radioman" aboard the battleship "Andrea Doria". He also is a RNARS member. No matter what one's country or allegiance, the originators of each of the QSLs referred to in this series of articles on the Senior Service share one thing in common — a past and present love of the sea.

Author's Note:

Over the past few years these articles on the stories behind QSLs in the WIA collection have given some examples of both the occupations and interests of radio amateurs. Scouting, Red Cross, Olympic Games, Rotary and the Navy have already been dealt with. Future articles are planned for Army, Air Force, Signals, Schools and Universities, Fire Services, Astronomy, Handicapped Persons, Royalty, Police, Railways, Religion, Fine Arts and Sport to name just a few. Readers possessing QSLs or information on amateur radio activity in any of these fields are invited to contact the author in order that local information in particular can be incorporated into the articles.

Thanks

The WIA (Vic Div) would like to express its appreciation to the following for their kind donations of QSL cards: (Supplementary list)

Dick	VK4GOR
Terry	VK2ALG
Peter	ex-MP4BBA
Mike	G7EUL
Pete	KK4VN
Vic	VK5AGX
Wolf	OE1WHC

* 4 Sunrise Hill Road, MONTROSE VIC 3765
Ph: (03) 728 5350

ar

Technical Correspondence

Norman Burton L20992
130 The River Road
Revesby NSW 2212

Broad Band RF Amplifiers

I am unable to agree with your remarks at the bottom of the first column on P20 of AR for April.

There were many broadband RF amplifiers used in valve receivers and I have reproduced four below.

Eddystone used to publish circuits that could be built up from mainly Eddystone parts, and it was common for them to use a broadband RF amplifier ahead of the reacting detector. They usually used an RF choke and with their receivers using plug-in coils, one could tune the range from 140 kHz to over 32 MHz. I would call this broadband, wouldn't you?

The Navy receiver used in WWII and built by AWA, type 1-C6940 used a broadband amplifier over its lowest range, whilst the Marconi CR300 used a broadband filter to cover its lowest range, 14-80 kHz. I had at one time in one of my cars, a Smith's radio which covered the broadcast band, and used a broadband filter in the front end, so allowing only the oscillator to be slug tuned.

One of the best known broadband receivers was the Wireless World "Single Span" which covered the broadcast band and European long wave band in one fell swoop, so eliminating band switching. It used an IF of 1600 kHz.

Many American broadcast band receivers of the late '20s and very early '30s used a broadband RF valve, and many of the designs published by the radio magazines of the '30s and on, in which sets were described for home construction and for use on short wave, as it was called, used a broadband RF amplifier valve using either choke or resistance in the grid circuit.

I think these examples are enough.

As to the article at whose end your comments appear, I'm not quite sure what the author is driving at; front-end selectivity to me means tuned circuits which give the double benefit of adjacent channel selectivity and prevention of first-stage overload, and he doesn't seem to mention these.

The weakness of the solid state front end is that no-one has been able to produce a solid-state equivalent of the variable mu valve, when they do, front-end problems will be over.

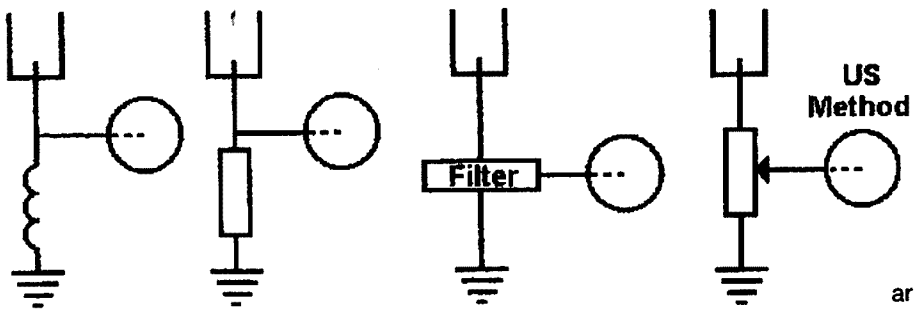
I have spent all my amateur life with receivers and receiver design and am far from impressed with the front-end performance of many modern communication receivers, the broadband front end is a problem producer, which is why I stick to valves for serious listening.

I have an excellent solid-state receiver with a tuned front end, which is supposedly tuned down to VLF, but below 500 kHz its performance is, and this is flattering, woeful. My 45-year-old Marconi CR200 runs rings around it, and it's not even a superhet!

It's comments like yours that keep us OTs on our toes!

EDITOR'S REPLY:

I am forced to admit that the original footnote was somewhat dogmatic! Perhaps it would have been better to say "more difficult" rather than "impossible". Nevertheless, because of their lower input impedances than valves, but similar order of capacitance, transistors do fit better into broadband systems needing significant gain ... VK3ABP.



ar

Pounding Brass

Gilbert Griffith VK3CQ *

Every few years or so, at least here in Australia, an event known as "The Great Morse Debate" rears its head. The last couple have reared their heads all over the packet bulletin boards much more than in the magazines. It seems though, that other countries do not have the same ordeals with "silly season" as we do here.

Writing his "Morseman" column for "Break-In" magazine in NZ, Gary Bold gives the following reflections on the "Great Debate" from Michigan, in the US, where he temporarily resides.

"The Morse/anti-Morse debate has never risen in the US to the level of fury and emotionalism it has in ZL. There is simply no major movement calling for its abolition. Indeed, the contrary often seems to be the case. For example, here's an extract from a resolution adopted by the board of the ARRL, in January 1993.

"WHEREAS: Morse Code is the international language that fosters communications between peoples with different languages, and

"WHEREAS: Knowledge of the Morse Code has, for decades, proven to be of positive value to the Amateur Radio Service worldwide; now therefore, the American Radio Relay League strongly

"REAFFIRMS its continued support for a demonstrated proficiency in the international Morse Code as part of the licence requirement below 30 MHz, and

"INSTRUCTS all ARRL representatives to continue to insist before all national and international bodies that there be no modification to the present proficiency requirement."

Now the ARRL is felt by many to be a conservative voice in US Radio politics. Nevertheless, many support it, and it has considerable influence. I don't think the international Morse requirement will be zapped before the ARRL stance changes.

My own opinion is that emotionalism belongs to music, movies, marriage and so forth. There are a great many things I would like to take part in, for instance, I would really love to fly a jet, drive a formula 1 racing car, fly a helicopter (etc etc ad nauseam) but for so many of these things there are criteria that must be satisfied first. So unless you are prepared to break the law, you will need the qualifications in order to enjoy the benefits.

With regard to Amateur Radio, I saw that eligibility required a knowledge of theory, regs and Morse, so naturally I set about learning enough to pass the exams.

It did not occur to me at the time that if enough people got together they could change the law, and now I am sure that the ideals and tradition of the Amateur Radio fraternity could be changed in this manner. But it would need to be called something like "Democratic Public Radio", because it wouldn't be Amateur Radio any more.

* *7 Church Street, Bright Vic 3741*

ar

Contests

*P Nesbit VK3APN — Federal Contest Coordinator **

Contest Calendar June-July 93

Jun 5/6	RSGB Field Day CW (May 93)
Jun 12/13	ANARTS WW DX RTTY (May 93)
Jun 12	VK/ZL/P29 80m Sprint (May 93)
Jun 19/20	WIA Novice Contest (May 93)
Jun 26/27	ARRL Field Day(May 93)
Jun 26/27	RSGB 1.8MHz Contest
Jul 1	Canada Day CW/Phone
Jul 3	Australasian 80m CW Sprint
Jul 3	NZART 80m Memorial CW/Phone
Jul 3/4	Venezuela SSB DX
Jul 10	Australasian Phone Sprint
Jul 10/11	IARU HF Championship
Jul 10/11	CQ WW VHF WPX Contest
Jul 11	Jack Files Memorial (Phone)
Jul 17	Colombian Independence Day
Jul 17/18	South-East Asia DX Contest
Jul 24/25	Islands On The Air Contest
Jul 24/25	Venezuela CW DX Contest
Aug 1	Jack Files Memorial (CW)
Aug 7/8	YO DX Contest
Aug 14/15	Worked All Europe CW
Aug 14/15	SARTG RTTY Contest
Aug 14/15	SEANET SSB DX Contest

Some more Australian sprints are coming up over the next couple of months. The main feature of a sprint is its limited duration, so that scores depend more on the number of QSOs which can be made in a short period of time, rather than transmitter power or antenna gain. Consequently one can be very competitive without having a super-dooper station, and the impact on family life is minimal. To further whet your appetite, this year NZART's 80m Memorial Contest coincides with the VK5/8 CW Sprint on 3 July, creating an opportunity for plenty of VK/ZL QSOs. If you haven't yet tried a sprint, why not give it a go?

Until next month, good contesting!

73

Peter VK3APN

Contest Details

The following contest details are supplemented by the "General Rules & Definitions" published in April AR.

Canada Day CW/Phone

July 1, 0000z-2359z Thursday.

This contest celebrates Canada's confederation, and occurs on the first of July each year. Bands 160-10m, CW and Phone. Suggested frequencies are (CW) 25 kHz up from the band edge, and (SSB) 1850, 3775, 7075, 7225, 14175, 21250, 28500. Check for CW activity on the half hour. Any station can work any other for QSO credit. Exchange RS(T) and serial number; Canadians will send RS(T) and province/territory. Score 10 points for Canadian QSOs including VE0 (ie maritime mobile), and 2 points for others. Canadians with RAC, VCA or QST suffixes are worth 20 points. Multiplier is Canadian provinces and territories (max 12), and count once per band and mode: VO1/2 (Newfoundland); VY2 (Prince Edward Isl); VE1/CY9/CY0 (Nova Scotia, Sable Is, St Paul Is); VE1; VE2; VE3; VE4; VE5; VE6; VE7; VE8; VY1 (Yukon). Final score is QSO points x multiplier. Send log and summary sheet in standard format, including dupe sheet, by 31 July to: "RAC, PO Box 356, Kingston, Ontario, K7L 4W2, Canada".

Australasian 80m Sprint (CW/Phone)

July 3 (CW), July 10 (Phone); 1100-1159z Sat.

This contest is organised by the Adelaide Hills Amateur Radio Society, and is co-sponsored by the VK5/8 Division of the WIA. The object is to make (and SWLs to hear and log) as many contacts with amateurs in VK, ZL and P2 as possible, without duplication, on 80m during a 1 hour period. Groups of amateurs using a single callsign, e.g. clubs, are also eligible. Frequencies are 3500-3700 (CW) and 3535-3700 (phone). Call "CQ Sprint", "CQ Contest" or "CQ TEST". Exchange RS(T) and serial number starting at any number between 001 and 999. Revert to 001 if 999 is reached.

Logs and summary sheets should be in standard format (see "General Rules & Definitions", April AR), and sent to: "AHARS, PO Box 401, Blackwood, SA 5051" to be received by Friday August 13. Endorse the envelope CW Sprint, Phone Sprint, or SWL Sprint. Certificates will be awarded to the highest scoring station (and SWL) in each VK, ZL, and P2 call area in both the CW and Phone sections. Trophies will be awarded to the outright winners of both. A certificate will also be awarded to the highest scoring Novice entrant in the CW Sprint, providing that the recipient is not entitled to another CW Sprint award. Other awards may be made at the Contest Manager's discretion. Standard disqualification criteria apply, and the Contest Manager's rulings and decisions are final.

David Box VK5OV
AHARS Sprint Contest Manager

NZART 80m Memorial Contest (CW)

July 3, 0800z-1400z Sat.

Australian amateurs are invited to join with amateurs from New Zealand in this yearly 80 metre contest to commemorate those from our ranks who lost their lives in World War II. It is open to single operator stations in the 80 metre band, and mobile operation is permitted.

The contest has six operating periods, each of one hour, from 0800z-1400z. A station may be contacted TWICE during each operating period — once on Phone and once on CW, providing that such contacts are not consecutive.

Exchange RS(T) plus serial number commencing at any number between 001 and 300 for the first contact. On phone, score 15 points for the first QSO with a scoring area, 14 points for the second QSO with that area, descending to 1 point for the 15th and subsequent QSOs with that area. The same scoring system is used for CW, except that QSO points remain at 5 for the 11th and subsequent QSO with that scoring area. Scoring areas are DXCC countries, and VK and ZL call areas. The rules for SWL entrants are similar except that the callsigns of the stations heard and being worked must be given, and only the cipher of the station heard is required.

Logs and summary sheets should be in standard format (see "General Rules & Definitions") and sent ASAP to: "Memorial Contest, PO Box 20 332, Auckland 7, New Zealand". Include a points summary showing the number of QSOs and points for each ZL call area. Certificates will be awarded to the top 3 scoring VKs.

Venezuela CW/SSB DX Contest

July 3/4 (SSB), July 24/25 (CW); 0000z Sat to 2400z Sun.

This is the 32nd annual contest celebrating Venezuela's independence. It is a world-wide contest, ie work both YV and other stations. Bands 80-10m. Categories are: single operator, single and all band; multioperator, single and muititransmitter.

Exchange RS(T) and serial number. Score 1 point for QSOs with own country, 3 points for QSOs with other countries in same continent, and 5 points for QSOs with other continents. Multiplier equals YV call areas plus number of countries worked (including own country) on each band. Final score is total QSO points from all bands x sum of multipliers from each band.

Include 2 IRCs or the equivalent to cover the cost of processing and mailing any awards. Send logs by September 30

(SSB) and October 31 (CW) to: "Radio Club Venezolano, Concurso Independencia, PO Box 2285, Caracas 1010-A, Venezuela".

IARU HF Championship

July 10/11, 1200z Sat to 1200z Sun.

This contest runs on the second full weekend of July each year. Bands 160-10m. Categories are single operator, CW only, phone only, mixed; multioperator single transmitter mixed mode only. Multioperator stations must remain on a band for at least 10 minutes at a time (exception: IARU member society HQ stations may operate simultaneously on more than one band with one transmitter on each band/mode, providing only 1 HQ callsign per band is used).

Exchange RS(T) and ITU zone (Note: ITU zones are NOT the same as the CQ zones used in most other contests. In our region they are P2 = 51, VK4/8 = 55, VK6 = 58, and VK1/2/3/5/7 = 59). HQ stations will send RS(T) and official society abbreviation.

Claim 1 point for QSOs within own zone or with an HQ station, 3 points for QSOs with different zone in own continent, 5 points for QSOs with different continents. Multiplier is total ITU zones plus IARU HQ stations worked on each band (note: HQ stations do not also count for zone multipliers). Final score is total QSO points from all bands x sum of multipliers from each band. Standard log format, dupe sheet for 500+ QSOs.

Send logs postmarked by August 11 to: "IARU HQ, Box 310905, Newington, CT 06131-0905, USA". Official forms and an ITU zone/prefix/continent map can be obtained from the same address on receipt of a large SASE with 2 IRCs or equivalent. Certificates to the top scorers in each category, in each state, ITU zone, and DXCC country. Also, stations with 250+ QSOs or 50+ multipliers will receive achievement awards.

Sunshine State Jack Files Memorial Contest

11 July (Phone), 1 August (CW); 0800-1300z Sun.

This contest honours the late Jack Files, a long-time VK4 WIA Councillor. The object is to encourage amateurs to work VK4s for the "Worked All Queensland" and other awards, to encourage portable/mobile activity from the less populated VK4 towns and shires, and to warm-up for the RD contest.

Categories are: Home VK4, Portable/Mobile VK4, Club Fixed VK4, Club Portable/Mobile VK4, VHF VK4, and all non-VK4. Bands are 3.5 and 144 MHz. Suggested calling frequencies are 3570-3595 (phone), and 3525-3550 (CW). On phone call "CQ Jack Files Contest", and on CW "CQ JF" or "CQ TEST". Exchange RS(T) plus serial number starting at 001. VK4 stations will add the code letters of their city/town/shire (see below), and club stations will also add "Club" or "Club Station". Club stations may use multiple operators providing there is only one transmitter operating at a time. Home stations may be reworked after 1 hour.

Mobile/portable stations are exempt from the one-hour rule when operating from a different city/town/shire. When operating within 1 hour from that of previous operations, they are regarded as "new" stations for scoring purposes. (Different is not to be taken as alternating, i.e. operating from Area A for 50 mins, then Area B for 50 mins, then Area A, would be considered alternating, not different). Operations from the same city/town/shire after 1 hour, regardless of movements within that area, are regarded as home station operation. Mobile stations should have drivers or log-keepers for road safety purposes.

Score 5 points per QSO with a VK4 station. Bonuses are 10 points for the FIRST contact with a city/town/shire in VK4 or VK6, and 10 points for each club station EACH TIME it is worked.

In the past, some mobile/portable entrants have devised ingenious interpretations to the rules. Such efforts are encouraged, provided normal operating etiquette and licence conditions are complied with. Share your ingenuity with the Contest Manager when submitting your log.

"One can be very competitive without having a super-dooper station."

After the Contest, participants are invited to enter a callback on 3575+/-QRM (phone) or 3535 (CW), to give preliminary results, share experiences, and make suggestions for next year's contest.

Awards include participation certificates to ALL stations submitting logs, certificates to the highest scorer(s) in each section, and where returns justify, second and third place certificates. A trophy may be awarded for outstanding effort, at the Contest Manager's descretion.

Logs and summary sheets should be set out in the standard way (see "General Rules and Definitions"). Mobile/portable entrants should include on the summary sheet the number of Cities/Towns/Shires operated from, and if possible a separate map or sketch showing the route and/or locations used. Submit logs to: "VK4 Jack Files Contest Manager, Bruce Bussenschutt VK4OR, 2 Dewrang Place, Wurtulla, Sunshine Coast, Queensland 4575", on or before 13th August 1993.

VK4 City/Town/Shire codes are as follows:

AL Albert; AA Allora; AC Aramac; AN Arakun (R); AT Atherton; BL Balonne; BA Banana; BC Barcaldine; BO Barcoo; BH Bauhinia; BT Beaudesert; BY Belyando; BD Bendemere; BG Biggenden; BX Blackall; BV Boonah; BO Booringa; BZ Boulia; BW Bowen; BN Brisbane*; BS Broadsound; BP Bulloo; BU Bundaberg*; BI Bungil; BK Burdekin; BR Burke; CB Caboolture; CS Cairns*; CL Calliope; CA Caloundra*; CM Cambooya; CD Cardwell; CP Carpentaria; CT Charters Towers*; CH Chinchilla; CF Clifton; CY Cloncurry; CK Cook; CN Crows Nest; CR Croyden; DY Dalby*; DL Dalrymple; DI Diamantina; DG Douglas; DU Duaringa; EA Eacham; ED Eidsvold; EM Emerald; EK Esk; ET Etheridge; FZ Fitzroy; FL Flinders; GT Gatton; GH Gayndah; GD Gladstone*; GL Glengallan; GC Gold Coast*; GM Gooburrum; GI Goondiwindi*; GY Gympie*; HT Herberton; HB Hervey Bay*; HK Hinchinbrook; IL Ilfracombe; IW Inglewood; IP Ipswich*; IS Isis; IF Isisford; JE Jericho; JO Johnstone; JY Jondaryan; KY Kilcoy; KK Kilkivan; KG Kingaroy; KO Kolan; LA Laidley; LV Livingstone; LC Logan*; LO Longreach; MC Mackay*; MA Mareeba; MO Maroochy; MB Maryborough*; MK McKinlay; ML Milmerran; MN Mirani; MV Miriam Vale; MT Monto; MR Moreton; MZ Mornington (R); MI Mt Isa*; MM Mt Morgan; MG Mulgrave; MU Mundubbera; MY Murgon; MX Murilla; MH Murweh; NN Nanango; NE Nebo; NO Noosa; PO Paroo; PD Peak Downs; PY Perry; PR Pine Rivers; PI Pioneer; PT Pittsworth; QL Quilpie; RC Redcliffe*; RD Redland; RI Richmond; RH Rockhampton*; RM Roma*; RO Rosalie; RL Rosenthal; SA Sarina; ST Stanthorpe; TB Tambo; TA Tara; TM Taroom; TH Thuringowa*; TI Tiaro; TO Toowoomba*; TE Torres; TV Townsville*; WG Waggamba; WO Wambo; WR Warroo; WA Warwick*; WH Whitsunday; WE Widgee; WI Winton; WD Wondai; WC Woocoo; WN Woongarra.

(R) = restricted area for radio transmission (Shire entry permit required).

* = City or Town (15 required for Worked All Cities and Towns Award. Send SASE to Contest Manager for details of these parts of the Worked All Queensland Award. Work 51 of the 111 shires for the VK4 Worked All Shires Award.

Bruce Bussenschutt VK4OR
Jack Files Contest Manager
** *24 Sovereign Way, Avondale Heights, 3034.*

ar

Club Corner

Hervey Bay Amateur Radio Club Inc

Just a short note letting you and your readers know that the Hervey Bay Amateur Radio Club Inc is still active but, owing to the ebb in propagation, this year we will not be activating any special award during our annual Hervey Bay Whale Festival. Instead, we will be calling CQ CQ, to all and sundry, on a 24-hour basis for the first seven days in August 1993, hoping to exchange cards with operators in as many different countries as possible.

The frequencies used will be as close to these as possible: 3.794, 7.100, 14.235, 21.250, 28.495 MHz, all +/– QRM of course; also Australian novice frequencies will be used as much as is possible, bands permitting.

For the information of any operators who made contact with either VI4HBW in 1992, or VI4FOW in 1992, which were two entirely different awards, there are still limited supplies of both awards available. The normal five green stamps secures either of these rather magnificent enlarged photographs of hump back whales at play. Together they make a very nice display for the shack wall.

Also, while on the subject of QSL cards, in November 1991 some members of our club activated Fraser Island OC142. We made some 4500 contacts in eight days, we still have quite a lot of these specially printed cards left, so any island chasers who made contact with us are still able to obtain their verification QSL card for the price of return postage. If you can see your way clear to put the relevant parts of this information into print in your magazine it will allow us later on this year to close the logs with the thought that we have done our best for AR. Incidentally, we are still receiving QSL cards through the bureaus, and because of backlog in some countries, it is to be expected that this will continue for some time.

Application for any of these awards and/or QSL cards may be sent to The QSL Manager, HBARC Inc, PO Box 829, Hervey Bay, Queensland 4655, Australia. Please rest assured that all are answered, 100 per cent.

Thank you for your time and trouble, and I trust you are having a very happy and successful 1993.

Jim White VK4BX
Secretary HBARC Inc
PO Box 829
HERVEY BAY, Qld 4655, Australia.

Dentist Amateurs

No — not amateur dentists (what a frightening thought!) but dentists who are licensed amateurs may wish to note this item.

The Japan Dental Ham League (JDHL), which has 130 members, has suggested the setting-up of an international personal computer network to extend its present JDHL Net "In order to make a world intelligence network for dentists".

Interested? Contact Dr Colin Wall VK2JC, executive director of the Australian Dental Association, at PO Box 520, St Leonards 2065; or Fax (02) 902 4676.

South Coast Amateur Radio Club News

The South Coast Amateur Radio Club Inc would like to invite you to attend the inaugural "South Australian technical Symposium". This event will be held in Adelaide on Saturday 24 July 1993, and is open to anyone with an interest in radio and electronics.

The aim of this event is to promote experimental and home-brew aspects of amateur radio today. Thirteen lectures will be presented covering a wide range of topics. Further to last month's information, we can now announce that our special guest lecturer will be Leigh Baker VK3TP, the WIA Federal WICEN co-ordinator. Leigh will speak on WICEC and its roles in amateur radio and the community. Other topics include:

160m Home Brew Equipment (John VK5BJE)
Amateur Microwaves (Des VK5ZO)
Packet Radio (Terry VK5GU and Grant VK5ZWI)
Short-Wave Listening (Jerome van der Linden)
Amateur Satellites (Graham VK5AGR and Garry VK5ZK)
6m-23cm Propagation (Eric VK5LP)
VLF/LF Techniques (Lloyd VK5BR)
VHF/UHF Construction and Equipment (David VK5KK)
Home-Brew Antennas (Peter VK5TZX)
Politics in Amateur Radio (Geoff VK5TY)

Many of the lecturers are planning demonstrations of equipment to complement their talks. Some of these include a display of 160m equipment, a live demonstration of microwave equipment and a chance to get some hands on experience driving a packet radio station. Visitors will also be able to see the VK5TTY Packet/RTTY Gateway BBS in operation.

The event will be held at the Kingston TAFE College, O'Halloran Hill in Adelaide. Lunch, morning and afternoon tea will be provided, as well as a copy of the notes from all lectures. The cost is $15. The presentations will be organised in three streams, allowing a choice of topics to be selected. The WIA (VK5 Div) Equipment Supplies Kits and Publications will also be available during the day.

If you are interested in attending, please register by 9 July, as seats are limited!!!

To register or obtain more information you can contact Grant Willis (VK5ZWI) on telephone (08) 277 3077 or Peter Cockburn (VK5TZX) on (08) 276 6703 between 7-9pm CST. You can also send a packet message to VK5ARC @ VK5TTY.#ADL.#SA.AUS.OC, or contact us by post at:

SA Technical Symposium
c/- South Coast ARC Inc
PO Box 333
MORPHETT VALE, SA 5162.

We hope to see you at the symposium!

Moorabbin and District Radio Club

Successful Hamfest

The Club has a big problem — space! About 10 years ago the idea was conceived of holding a Trade Show in the club rooms during Show Week.

The idea was that country and perhaps interstate amateurs visiting Melbourne for the Royal Show could come to Moorabbin and see all the latest gear in one place instead of spending many hours travelling from dealer to dealer scattered around Melbourne.

The late Harold Webber, VK3PW, was the first organiser and it was a popular success. It soon outgrew the Club's fairly spacious facilities and a hired marquee was added. Trading in pre-loved gear had been added to Trade displays by this time and sales of used gear from the owner's car boot were encouraged. The date had now moved from September to May.

Wet weather quite literally dampened enthusiasm for this type of operation and for the next couple of years the assembly hall and some class rooms of a local school were used. Two years ago there was still not enough space and the venue was shifted to the large assembly hall plus a couple of class rooms at the Brentwood Secondary College in Glen Waverley where the latest, — 1st May — event was staged and very well organised by Trevor Armstrong (recently upgraded to VK3JJR) and a big team of helpers.

Well — what an event! There were extensive displays by a very representative group of eight traders. There were 52 separate hopeful sellers of pre-loved gear and this must have

weighed several tons. It had to be seen to be believed and, by golly, a heck of a lot of it changed hands.

The doors were open early for traders to move in their gear but the paying customers were held back until 10 am by which time over 100 prospective customers were milling around outside and the extensive parking facilities were steadily filling up. For the next three hours the place was crowded.

When Jim Linton, VK3PC, WIA Victorian President officially declared the show open at 11 am he described the event as the "Mother of Hamfests". In addition to the frenzied buying and selling there were displays by the Melbourne Packet Radio Group and the Melbourne Amateur TV group. Also represented were WICEN, the Australian Volunteer Coast guard, the St John First Aid and the ladies ALARA group.

Club officials estimate that more than 600 people passed through during the very successful day and it looks like we should try and find an even larger venue for May 1994.

Watch this space, especially if you missed out this year.

Allan Doble, VK3AMD.
ar

Awards

John Kelleher VK3DP Federal Awards Manager

In answer to many requests for a more difficult award to earn, I think I have to present one of the most difficult. It is the United States of America Counties Award, sponsored by CQ Magazine. It is issued for confirmed two-way radio contacts with specified numbers of US counties, under the following rules and conditions.

The USA-CA is issued in seven different classes, each a separate achievement as endorsed on the basic certificate by use of special seals for higher class. Also, special endorsements will be made for all one band or mode operations subject to the rules.

Class	*Counties Required*	*States Required*
USA-500	500	Any
USA-1000	1000	25
USA-1500	1500	45
USA-2000	2000	50
USA-2500	2500	50
USA-3000	3000	50

USA 3076-CA for ALL counties and Special Honours Plaque ($40)

USA-CA is available to all licensed amateurs everywhere in the world, and is issued to them as individuals for all county contacts made, regardless of calls held, operating QTHs or dates. All contacts must be confirmed by QSL, and such QSLs must be in one's possession for identification by certification officials. Any QSL card found to be altered in any way disqualifies the applicant. QSOs via repeaters, satellites, moonbounce and phone patches are not valid for *USA-CA*. So-called "team" contacts, wherein one person acknowledges a signal report and another returns a signal report, while both amateurs callsigns are logged, are not valid for *USA-CA*. Acceptable contact can be made with only one station at a time.

Unless otherwise indicated on QSL cards, the QTH printed on cards will determine county identity. For mobile and portable operations, the postmark shall identify the county unless information stated on QSL cards makes other positive identity. In the case of cities, parks or reservations not within counties proper, applicants may claim any one of adjoining counties for credit (once).

The *USA-CA* program will be administered by a CQ staff member acting as *USA-CA* Custodian, and all application and related correspondence should be sent directly to the custodian at his or her QTH. Decisions of the custodian in administering these rules and their interpretation, including future amendments, are final.

The scope of *USA-CA* makes it mandatory that special record books be used for application. For this purpose, CQ has provided a 64-page 4-1/4 x 11-inch record book which contains application and certification forms, and which provides record-log space meeting the conditions of any class award and/or endorsement requested. A completed USA-CA record book constitutes medium of basic application and becomes the property of CQ for record purposes. On subsequent applications for either higher classes or for special endorsements, the applicant may use additional record books to list required data or may make up own alphabetical list conforming to requirements. Record books are to be obtained directly from CQ, 76 North Broadway, Hicksville, NY 11801. It is recommended that two be obtained, one for application use and one for personal file copy.

Make record book entries necessary for county identity and enter other log data necessary to satisfy any special endorsements (band-mode) requested. Have the certification form provided signed by two licensed amateurs (general class or higher) or an official of a national-level radio organisation or affiliated club verifying the QSL cards for all contacts as listed have been seen. The *USA-CA* custodian reserves the right to request any specific cards to satisfy any doubt whatever. In such cases, the applicant should send sufficient postage for return of cards by registered mail. Send the original completed record book (not a copy) and certification forms and handling fee. Fee for non-subscribers to CQ is $US10 or 40 IRCs; for subscribers, the fee is $4 or 12 IRCs. Send applications to USA-CA Custodian, Dorothy Johnson, WB9RCY, 333 South Lincoln Ave, Mundelein, IL 60060, USA.

For later applications for higher class seals, send record book or self-prepared list per rules and $US1.25 or six IRCs handling charge. For application for later special endorsements (band/mode) where certificates must be returned for endorsement, send certificate and $US1.50 or eight IRCs for handling charges. Note: At the time any *USA-CA* award certificate is being processed there are no charges other than the basic fee, regardless of number of endorsements or seals; likewise, one may skip lower classes of *USA-CA* and get higher classes

without losing any lower awards credits or paying any fee for them.

[The Mobile Emergency and County Hunters Net meets on 14,336 kHz SSB every day. The CW County Hunters Net meets on 14,066.5 kHz daily].

Deletions (1)

The ARRL Awards Committee has voted unanimously to accept a recommendation of the DXAC to add Macedonia (4N5·YU5) for contacts made 8 September 1991 and after.

The Awards Committee also voted unanimously to accept a DXAC recommendation to delete Czechoslovakia (OK, OM) effective 1 January 1993.

Replacing Czechoslovakia, in accordance with DXAC recommendations, are the Czech Republic (OK-OL) and the Slovak Republic (OM).

At the time of going to press, many amateurs are awaiting the outcome of a referendum being conducted in Eritrea, which is attempting to regain country and DXCC status.

Deletions (2)

The following 54 stations, taken from the active WIA DXCC list, have been affected by the deletion of Abu Ail (A15, J2A etc).

VK1ZL	VK3OT	VK4BG	VK5MS	VK6PY
VK2WC	VK3OI	VK4DP	VK5OU	VK6RO
VK2AKP	VK3VU	VK4KS	VK5QW	VK6RU
VK2APK	VK3EWJ	VK4LC	VK5WO	VK6YF
VK2AVZ	VK3XB	VK4OH	VK5WV	VK6AJW
VK2BQS	VK3YJ	VK4QO	VK5XN	VK7AE
VK2FGI	VK3YL	VK4RF	VK5ARA	VK7BC
VK2VBL	VK3AKK	VK4UC	VK6HD	VK7LZ
VK3DP	VK3AWY	VK4VC	VK6HE	WA3HUP
VK3DU	VK3CSR	VK5BO	VK6LK	WB3CQN
VK3KS	VK3DYL	VK5EE	VK6NE	

ar

Spotlight on SWLing

*Robin L Harwood VK7RH **

Winter has arrived and the band conditions have also changed. Now we are getting strong signals on HF from Europe, the Mid-east and the Americas, during daylight hours. For example, I did hear Radio Tashkent in Uzbekistan on 15200 kHz at around 0249 UTC. The programme was in an oriental language akin to Russian, possibly Uzbeki but I am not certain. The religious broadcaster FEBA in the Seychelles, between East Africa and Sri Lanka, was heard on 15325 kHz, mixed in another station in Spanish. The programme at 0340 UTC was in Arabic but the audio was poor.

There is a station on 9350.4 kHz at 0415 UTC, broadcasting in Farsi, the language of Iran. Signals were good as was the modulation. I was not surprised to ascertain that it is a clandestine station. Overseas reports indicate that it is known as the "Voice of Human Rights in Iran", formerly "Iran's Flag of Freedom Radio". Speculation is that the sender was located in Egypt, but most HF broadcasts from Egypt usually have bad hum on their modulation. This isn't the case with the above signal.

Sri Lanka is an island off the southern tip of India and is about the same size as Tasmania. Formerly known as Ceylon, this nation is best known for the Tea which is grown on plantations. There has been serious political strife ever since the island gained its independence from Britain in the late forties. Political assassinations have frequently disrupted government there. Also there has been an ongoing civil war between the majority Sinhalese and the Tamils, who mainly are in the north and east.The Tamils are fighting for independence from Sri Lanka and want to be joined to the Indian state of Tamil Nadu.

This civil war has hit hard at the economy and as you may recollect, several international broadcasters have installed relay sites within Sri Lanka. The VOA were the first, then the Germans followed with a base at Tricomallee. This was right in the thick of the fighting with the Tamils. For about 18 months, the site was closed and only re-opened when the military regained control of the area. The Japanese also commenced broadcasting from the main site at Ekkala in the south, about the middle of 1992. You can hear them on 17820 kHz at around 0400 UTC in Japanese followed by English.

On the first of May, after being tipped off by a TV newsflash that the President of this nation had been injured in a bomb blast, I decided to tune in for the All Asian Service of the SLBC. At the best of times, signal levels are well down and this was no exception. However, it was clear enough for me to follow the English programme. They commenced with a solemn announcement that the president had been assassinated by a suicide bomber at 12:45 local time and that the Prime Minister had been sworn in as acting president. Nearby splatter increased to the point of swamping the signal. The All Asian Service of the SLBC can be heard on 9720 kHz at 1230 UTC with an English programme. This is a semi-commercial programme servicing South Asia. I can remember hearing this station on the 19 metre band at about 0200 UTC some thirty five years ago, when it was close to Radio New Zealand's channel.

"The programme was in an oriental language akin to Russian."

I recently had the opportunity of evaluating the Yaesu FT 747GX transceiver, particularly the General Coverage section of it. I was pleasantly surprised at the performance, compared to my Icom R70, although it was susceptible to electrical noise. This seems to come from inside the set possibly from the digital display or from the external power supply. Yet it wasn't that bad, compared to some I've heard. It is just that I am used to the quiet background noise of the Icom R70. The sensitivity was good as was the selectivity.

I was particularly impressed with the width and IF shift control, which significantly reduced the channel splatter. Also tuning in to a signal, I was able to switch sidebands without altering the main dial. This was the first occasion I have been able to assess a transceiver with an inbuilt general coverage facility on receive, and I am impressed. My thanks to Robert, VK2YRX, for his assistance.

Well, that is all for this month. Don't forget, you can now contact on Packet as follows: VK7RH@VK7BBS or via the address below.

* *52 Connaught Crescent, West Launceston TAS 7250*

ar

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets the passing of :

L A	Castelli	L20868
T W (Thomas)	Barnes	VK2ABI
J T (John)	Lake	VK2OK
D G (Dick)	Meerstadt	VK2RM
C W (Charles)	Crook	VK3PT
I (Ian)	Nally	VK3ZFH
K J	Callahan	VK4NQA

Dick Meerstadt VK2RM

Dick died on 6/4/93, aged 73. He saw service in the Dutch navy in World War II.

He was ill-treated as a prisoner of war, and his health was affected.

Dick and his wife Mary lived at Woodford in the Blue Mountains. In his 30 years of amateur radio Dick was a member of the WIA Blue Mountains branch, which later became the Blue Mountains Amateur Radio Club, in which Dick was a life member. He was also a member of the Royal Naval Amateur Radio Society.

Dick and Mary moved to Corindi Beach to enjoy retirement and became a member of the Coffs Harbour Amateur Radio Club. Dick's working life was at AWA and Ducon Pty Ltd. He was a great family man. To Mary and family we extend deepest sympathy.

Dennis St Ruth VK2EMF

Thomas William Barnes VK2ABI

Tom died on 20 April after a long illness.

He obtained his licence in 1935, and his main interest was in the HF bands.

Tom came to Australia at the age of seven with his parents. By determined night study at the Sydney Technical College whilst working with a gold-refining firm, he obtained qualifications which enabled him to become a lecturer in metallurgy at the Wollongong University.

Always cheerful and helpful to others, he will be sadly missed by his many friends. He is survived by wife Victoria, and children John, Phillip and Erica.

Jim Webster VK2BZD

John T Lake VK2OK

John Lake passed away at his home in Nambucca Heads on Thursday 6th May 1993. He had been ill for some time.

He served throughout and after World War 2 in the Australian Army, in "Sigs" at many levels and in many functions, including service in North Africa,Syria, Bougainville and the occupation of Japan.

Licensed by the Allied Military Government of Japan as JA5AI in 1948 he operated as one of the few Australian amateurs, largely, but not exclusively on 28 MHz. On return to Australia in 1951 he was allocated callsigns VK2OK, VK3UF, and again VK2OK.

In 1956 he retired from the Army, joined Mullard in Sydney until 1970, when he relocated to the mid north coast of NSW, the Macksville — Nambucca area. Until declining health forced otherwise he was active in amateur radio, particularly experimentation and construction, and his wife Barbara, in regional affairs.

He was named "Senior Citizen of the Year" by Nambucca Shire on Australia Day, 1991.

John was a conscientious and competent operator on HF, CW Phone and RTTY (the early days of Model 15s) and VHF FM. He was helpful, patient and courteous to all, possessed a keen, enquiring mind and well developed constructional skills. His great joys were to explore complex theoretical aspects reducing esoteric terms to meaningful English, particularly as Editor of the journal "Mullard Outlook" from 1958 to 1970, and in converting theory into practical, safe and durable items of electronic hardware.

Farewell friend, you gave more than you ever took.

Ted Mulholland, VK4AEM
ar

ALARA

Robyn Gladwin VK3ENX

Alarameet Update

We now have 75 names on the list but hoping for a few more. Saturday will be the main day, but if you can come to any part of the weekend, please do, as you will be most welcome. The West End Hall will be open from 9 am on both days for anyone to sit and chat; tea and coffee will be available all day. There will be ample time to talk. The tours are optional but will be confirmed when you return the acceptance form.

The City of Castlemaine, through its Tourist Information Centre, has provided a wealth of information for prospective visitors and we thank them for their support. The programme is as follows:

Friday Oct 1st
6.30 pm Optional counter tea Northern Hotel.
Saturday 2nd
9.00 am Registration. Photo session.
11.00 am Official welcome.
12 noon Lunch.
1.30 pm Journey to Maldon Railway Station.
2.00 pm Steam Train Ride.
3.00 pm Free time in Maldon.
7.00 pm Official Dinner at Castle Motel.
Sunday 3rd
9.00 am Tours of the area and visit to Buda, an historic homestead.
12 noon Lunch.
1.30 pm Official Closing Ceremony.

The Alarameet Co-ordinator, Margaret Loft, has worked very hard to finalise these arrangements and Alara members appreciate the efforts she has made. If you would like more information, her address is 28 Lawrence Street, Castlemaine, Victoria, 3450.

Gold Coast Ladies Group

This group is an adjunct of the Gold Coast ARS. The GYLs meet once a month at the Club Rooms and have plans to involve all members in events such as BBQs, river cruises, and theatre visits.

They intend to revitalise the Awards section of the main radio club by operating regular contacts using the club's fine equipment. There are YLs in the current training course, Novice and upgraders. The GYLs are hoping to make visiting YLs feel welcome, on air and in person, by taking part in the GCARS early morning net.

Resident Alara Cartoonist

Many thanks to Dorothy Bishop, VK2DDB, for her comments on the wonderful world of amateur radio.

33

** Box 438 Chelsea 3196 VK3ENX@VK3YZW*
ar

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used to make these predictions is 65.8, next month's predicted value is 63.9.

ar

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.0	10	7.2	0	-20	...	...	...
2	8.4	2	6.5	-1	-19	-39	...	...
3	6.1	-6	6.3	-2	-19	-38	...	...
4	11.2	0	6.7	3	-4	-16	-33	...
5	17.0	6	13.2	4	5	1	-7	-18
6	21.4	8	16.5	3	8	7	1	-7
7	20.0	6	15.0	3	7	5	-1	-10
8	17.5	7	13.1	6	6	2	-7	-19
9	14.5	8	10.9	6	3	-5	-18	-34
10	12.0	5	9.0	5	-3	-14	-32	...
11	10.1	4	7.5	3	-11	-27	...	...
12	9.1	8	6.8	1	-18	-38	...	...
13	8.7	14	6.4	0	-23	...	...	...
14	8.5	23	6.3	0	-27	...	...	...
15	8.7	27	6.4	1	-27	...	...	...
16	8.8	29	6.6	0	-28	...	...	...
17	8.4	31	6.4	-2	-34	...	...	...
16	8.3	31	6.3	-2	-35	...	...	...
19	8.2	32	6.2	-3	-35	...	...	...
20	8.0	32	6.2	-4	-37	...	...	...
21	8.8	31	6.7	0	-29	...	...	...
22	8.5	30	6.5	-2	-33	...	...	...
23	7.9	23	6.2	-8	-37	...	...	...
24	7.8	14	6.2	-6	-34	...	...	...

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.4	18	11.1	19	16	10	0	-10
2	15.4	19	10.5	20	15	8	-3	-16
3	14.5	21	9.9	21	14	5	-7	-22
4	13.9	26	9.5	25	14	4	-11	-28
5	13.9	24	9.6	24	14	4	-10	-27
6	14.7	24	10.2	25	15	6	-8	-24
7	14.9	21	11.3	22	13	3	-11	-28
8	12.8	15	9.5	13	3	-8	-26	...
9	10.7	5	7.9	5	-5	-17	-37	...
10	9.6	-4	7.1	1	-7	-20	-39	...
11	9.1	-14	6.7	0	-7	-18	-36	...
12	8.9	-20	6.5	0	-6	-16	-31	...
13	9.0	-31	6.7	-6	-9	-18	-34	...
14	9.2	-39	6.8	-10	-12	-20	-35	...
15	9.5	...	7.0	-14	-14	-21	-35	...
16	9.2	...	6.9	-20	-20	-28	...	...
17	6.5	...	6.5	-27	-28	-36	...	...
18	6.4	...	6.4	-26	-28	-39	...	...
19	10.0	-29	7.3	-7	-7	-13	-26	...
20	13.5	-6	10.4	-4	-1	-4	-12	-24
21	17.5	3	13.4	-2	3	2	-4	-12
22	18.9	10	13.0	6	10	9	3	-4
23	18.2	14	12.4	13	14	11	5	-4
24	17.3	16	11.8	17	15	11	3	-7

VK EAST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.5	23	20.7	35	35	33	28	21
2	27.3	24	20.5	35	35	33	28	21
3	27.1	24	20.4	37	36	33	28	21
4	26.6	25	20.0	39	37	34	28	20
5	24.9	26	18.6	42	38	34	26	18
6	22.4	30	17.0	46	39	33	23	12
7	19.3	32	14.6	45	36	27	15	1
6	16.5	35	12.4	42	30	18	3	-12
9	14.1	38	10.6	37	22	8	-9	-29
10	12.6	39	9.5	33	16	0	-20	...
11	11.6	40	8.8	30	11	-5	-28	...
12	11.2	41	8.4	28	8	-9	-34	...
13	10.9	41	8.1	27	6	-12	-37	...
14	10.6	41	8.1	26	6	-12	-38	...
15	11.0	41	6.3	27	7	-11	-36	...
16	10.3	42	7.8	24	2	-18	...	...
17	9.0	44	6.9	16	-9	-33	...	...
18	8.7	44	6.7	14	-12	-36	...	...
19	11.6	40	9.0	29	10	-7	-30	...
20	17.0	32	13.2	36	29	19	5	-9
21	22.2	27	17.1	39	35	29	20	10
22	25.3	25	19.4	37	36	32	26	18
23	26.5	24	20.2	36	35	32	27	20
24	27.1	23	20.5	35	35	32	27	21

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.5	11	19.4	11	17	16	12	6
2	24.9	11	19.4	10	16	15	11	5
3	24.8	11	18.9	9	16	15	11	5
4	25.1	11	19.4	10	16	16	12	5
5	25.7	11	19.8	12	18	17	13	6
6	24.9	12	19.0	15	19	17	12	5
7	23.0	13	17.6	20	20	16	9	0
8	20.5	16	15.6	25	21	14	3	-9
9	18.1	19	13.8	29	19	8	-7	-24
10	15.8	21	12.0	27	12	-2	-22	...
11	14.4	23	10.9	23	5	-12	-36	...
12	13.5	24	10.2	20	0	-20	...	...
13	12.8	25	9.7	18	-5	-26	...	...
14	12.4	25	9.5	15	-8	-31	...	...
15	11.9	25	9.1	13	-12	-37	...	...
16	11.9	25	9.1	13	-12	-37	...	...
17	10.8	26	6.3	5	-25	...	...	...
18	8.9	28	6.9	-13	...	...	...	...
19	8.5	28	6.6	-19	...	...	...	...
20	11.5	27	8.9	13	-13	-38	...	...
21	15.5	21	12.1	25	12	-1	-20	...
22	22.3	16	17.2	23	22	18	10	0
23	25.5	13	19.6	18	21	19	14	7
24	25.7	12	19.7	14	19	18	13	7

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.6	8	11.8	6	7	3	-5	-17
2	15.9	2	11.9	-1	4	1	-5	-15
3	18.5	2	13.7	-8	2	3	0	-6
4	21.6	4	16.3	-13	1	4	4	0
5	23.2	5	17.9	-17	0	4	5	2
6	23.5	5	18.4	-17	0	4	5	2
7	23.9	4	18.1	-14	0	4	3	0
8	21.5	4	16.3	-9	2	4	1	-4
9	18.5	3	14.0	-3	3	2	-3	-11
10	15.8	3	12.0	1	3	-1	-10	-22
11	13.6	3	10.3	4	1	-7	-20	-36
12	12.2	5	9.2	6	-1	-12	-30	...
13	11.5	10	8.6	8	-4	-18	-39	...
14	11.0	16	8.3	9	-7	-24	...	...
15	10.8	22	8.2	11	-8	-28	...	...
16	10.8	26	6.1	12	-9	-30	...	...
17	11.0	27	6.3	14	-6	-29	...	...
18	10.3	29	7.8	10	-14	-37	...	...
19	9.0	31	6.9	2	-28	...	...	...
20	8.7	31	6.7	0	-31	...	...	...
21	11.4	29	8.6	16	-4	-25	...	...
22	13.4	27	10.4	24	10	-4	-24	...
23	12.9	19	9.9	17	5	-7	-26	...
24	16.6	14	12.7	15	13	7	-3	-16

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.9	7	19.7	-8	5	8	7	4
2	24.1	10	19.4	0	10	11	9	5
3	22.8	15	18.3	11	16	16	12	6
4	21.6	18	17.2	22	22	19	13	5
5	20.6	22	16.5	31	27	21	13	4
6	20.1	24	15.9	35	26	21	11	0
7	19.2	21	14.6	34	24	15	2	-12
8	16.5	24	12.5	31	18	6	-10	-28
9	14.2	26	10.7	26	10	-4	-25	...
10	12.8	27	9.6	22	3	-14	-38	...
11	12.0	28	9.0	18	-1	-21	...	...
12	11.4	29	8.5	16	-5	-26	...	...
13	11.0	26	8.3	13	-8	-28	...	...
14	10.9	18	6.2	9	-8	-27	...	...
15	11.0	12	8.3	7	-7	-23	...	...
16	10.1	2	7.7	2	-10	-26	...	...
17	8.7	-11	6.7	-2	-15	-31	...	...
18	8.4	-20	6.5	-2	-13	-28	...	...
19	11.3	-10	8.8	-2	-5	-13	-27	...
20	16.8	0	13.0	-6	0	-1	-8	-17
21	21.9	3	16.8	-12	0	3	1	-4
22	24.3	4	18.9	-15	0	4	4	0
23	24.6	5	19.5	-15	0	5	5	2
24	24.9	6	19.7	-13	2	6	6	3

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.0	22	6.9	3	-21	...	...	...
2	8.7	14	6.7	0	-22	...	...	...
3	11.8	14	8.7	11	-2	-16	-37	...
4	17.6	13	13.6	16	13	6	-5	-18
5	21.0	10	17.0	11	13	9	2	-7
6	22.6	9	18.2	9	12	10	5	-3
7	21.4	8	17.1	8	11	9	2	-6
8	19.3	9	15.4	9	10	6	-2	-13
9	16.7	9	13.2	10	7	0	-11	-25
10	13.9	9	10.9	8	1	-8	-24	...
11	11.6	9	9.1	6	-6	-20	...	...
12	9.8	10	7.6	2	-16	-38	...	...
13	9.0	14	6.9	-1	-24	...	...	...
14	8.6	22	6.6	-3	-31	...	...	...
15	8.7	26	6.7	-2	-32	...	...	...
16	8.9	28	6.8	0	-30	...	...	...
17	8.9	30	6.8	0	-30	...	...	...
18	8.9	31	6.8	1	-29	...	...	...
19	8.7	30	6.8	-1	-33	...	...	...
20	8.3	31	6.5	-6	...	...	...	...
21	8.2	31	6.4	-6	...	...	...	...
22	9.0	31	7.0	1	-28	...	...	...
23	8.4	31	6.6	-2	-34	...	...	...
24	8.3	27	6.6	-3	-34	...	...	...

VK SOUTH SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.2	14	15.2	23	18	11	0	-13
2	20.8	14	15.6	24	20	13	2	-10
3	20.9	14	15.6	25	21	14	2	-10
4	20.3	16	15.4	27	21	13	1	-12
5	18.3	18	13.9	28	19	8	-8	-23
6	15.9	23	12.0	29	14	0	-21	...
7	13.6	26	10.3	23	3	-15	...	...
8	11.7	29	8.8	15	-10	-33	...	...
9	10.0	31	7.5	4	-27	...	...	...
10	9.0	32	6.7	-4	...	...	...	...
11	8.1	33	6.1	-14	...	...	...	...
12	7.7	34	5.7	-20	...	...	...	...
13	7.6	34	5.6	-22	...	...	...	...
14	7.7	34	5.7	-20	...	...	...	...
15	7.9	34	5.9	-17	...	...	...	...
16	7.3	35	5.6	-24	...	...	...	...
17	7.1	35	5.5	-28	...	...	...	...
18	7.2	35	5.6	-27	...	...	...	...
19	7.1	33	5.5	-29	...	...	...	...
20	8.6	25	6.7	-9	...	...	...	...
21	11.5	19	8.9	9	-12	-33	...	...
22	14.8	16	11.4	18	5	-8	-28	...
23	17.4	15	13.3	21	13	3	-11	-29
24	19.0	14	14.4	22	16	8	-4	-19

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	5	10.4	4	5	1	-7	-18
2	14.0	9	9.9	9	6	0	-11	-24
3	13.4	11	9.5	11	5	-2	-15	-30
4	12.9	14	9.2	13	5	-4	-18	-34
5	13.1	15	9.4	14	6	-3	-17	-33
6	13.8	16	9.9	16	8	0	-13	-28
7	14.8	16	10.8	16	11	3	-8	-21
8	16.0	14	11.6	15	10	3	-7	-21
9	14.2	10	11.6	10	3	-6	-20	-36
10	11.8	2	9.1	3	-4	-15	-31	...
11	9.9	-7	7.6	-1	-9	-21	-39	...
12	9.0	-16	6.9	-2	-10	-21	-39	...
13	8.6	-31	6.5	-8	-14	-25	...	...
14	8.5	...	6.5	-17	-23	-34	...	...
15	8.7	...	6.8	-25	-28	-38	...	...
16	8.8	...	6.7	-31	-32	...	...	...
17	9.0	...	6.9	-35	-35	...	...	...
18	8.7	...	6.7	...	...	...	...	...
19	8.1	...	6.3	...	...	...	...	...
20	8.0	...	6.3	...	...	...	...	...
21	9.3	...	7.0	-26	-26	-34	...	...
22	11.9	-18	9.5	-7	-4	-9	-18	-30
23	15.2	-4	11.8	-7	-2	-4	-11	-21
24	15.6	0	11.0	-2	2	0	-5	-14

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.5	9	16.3	8	12	9	3	-5
2	22.1	9	16.9	7	12	10	5	-2
3	22.3	10	16.9	6	12	11	6	-1
4	22.8	9	17.2	6	12	11	6	-1
5	22.6	10	17.0	8	13	11	6	-2
6	21.7	10	16.4	11	14	11	4	-4
7	19.9	11	15.0	14	13	8	0	-12
8	17.5	13	13.3	18	12	3	-10	-26
9	14.7	17	11.1	19	4	-10	-32	...
10	12.3	20	9.3	11	-11	-33	...	...
11	10.4	22	7.8	-1	-33	...	...	...
12	9.3	24	7.0	-12	...	...	...	...
13	8.8	25	6.6	-19	...	...	...	...
14	8.5	26	6.4	-22	...	...	...	...
15	8.6	26	6.4	-22	...	...	...	...
16	8.8	25	6.6	-19	...	...	...	...
17	9.0	25	6.8	-16	...	...	...	...
18	8.7	25	6.6	-21	...	...	...	...
19	7.9	26	6.1	-33	...	...	...	...
20	7.7	26	6.0	-36	...	...	...	...
21	9.6	25	7.5	-8	...	...	...	...
22	13.4	11	10.4	10	-3	-19	...	...
23	17.3	10	13.3	12	8	1	-11	-26
24	20.1	9	15.4	10	12	8	0	-11

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.4	8	20.5	-5	7	10	9	5
2	25.9	11	19.7	4	13	14	12	7
3	24.2	15	19.4	16	20	19	14	8
4	22.6	20	18.1	27	25	22	15	8
5	21.8	20	16.9	33	28	22	13	2
6	19.7	21	14.8	33	25	17	5	-8
7	16.3	24	12.2	30	18	6	-10	-28
8	13.5	26	10.0	24	7	-8	-30	...
9	11.2	29	8.4	15	-6	-27	...	...
10	10.1	30	7.5	9	-18	...	...	...
11	9.5	30	7.0	5	-22	...	...	...
12	9.3	30	6.8	4	-24	...	...	...
13	9.4	27	7.1	4	-22	...	...	...
14	9.7	18	7.2	4	-17	-38	...	...
15	10.0	10	7.4	4	-13	-31	...	...
16	9.7	1	7.3	1	-12	-29	...	...
17	8.9	-9	6.8	-1	-13	-29	...	...
18	8.8	-16	6.7	-1	-11	-25	...	...
19	10.7	-11	7.8	-1	-5	-14	-30	...
20	14.6	-3	11.3	-4	0	-4	-13	-25
21	19.0	2	14.5	-8	1	1	-2	-10
22	22.4	4	17.0	-12	1	4	2	-2
23	24.3	5	18.4	-13	1	5	4	1
24	25.7	6	19.3	-11	3	7	7	3

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.4	20	10.9	20	10	-1	-17	-36
2	14.5	11	10.9	11	6	-1	-15	-31
3	17.0	7	13.4	4	6	3	-5	-15
4	19.9	6	15.1	-1	6	6	2	-5
5	21.4	6	16.5	-6	5	6	3	-2
6	21.6	5	17.0	-8	3	5	3	-1
7	22.1	5	17.6	-9	3	5	3	-1
8	22.8	4	17.2	-8	3	5	2	-3
9	21.1	4	18.0	-5	3	4	0	-7
10	18.8	4	14.3	0	4	2	-4	-14
11	16.0	4	12.1	3	3	-2	-13	-27
12	13.5	5	10.2	5	-1	-11	-27	...
13	11.5	7	8.7	4	-8	-23	...	...
14	10.3	12	7.8	3	-16	-36	...	...
15	9.7	19	7.3	1	-23	...	...	...
16	9.4	24	7.1	0	-29	...	...	...
17	9.4	26	7.2	0	-30	...	...	...
18	9.5	28	7.2	1	-29	...	...	...
19	9.7	28	7.4	3	-27	...	...	...
20	9.3	29	7.1	-1	-33	...	...	...
21	8.3	29	6.4	-10	...	...	...	...
22	8.1	30	6.2	-13	...	...	...	...
23	10.3	28	7.7	6	-21	...	...	...
24	11.7	28	9.0	17	-3	-23	...	...

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.4	15	10.7	15	12	6	-3	-15
2	14.5	18	10.1	18	12	4	-7	-22
3	13.8	21	9.6	20	12	2	-12	-28
4	13.3	26	9.4	24	12	0	-16	-34
5	13.4	25	9.5	24	12	1	-15	-33
6	14.2	24	10.1	24	14	4	-10	-26
7	14.3	19	11.0	20	8	-3	-20	...
8	11.9	14	9.3	10	-2	-16	-36	...
9	10.0	6	7.8	3	-10	-26	...	...
10	9.1	-3	7.0	0	-12	-28	...	...
11	8.7	-10	6.7	0	-11	-25	...	...
12	8.7	-16	6.6	0	-9	-21	...	...
13	8.8	-29	6.9	-6	-13	-24	...	...
14	8.9	...	6.8	-14	-19	-30	...	...
15	9.1	...	7.0	-21	-24	-34	...	...
16	8.8	...	6.8	-31	-33	...	...	...
17	8.2	...	6.4	...	...	...	...	...
18	8.1	...	6.4	...	...	...	...	...
19	9.4	...	7.1	-29	-29	-37	...	...
20	11.9	-15	9.5	-6	-2	-6	-14	-26
21	15.3	-5	12.3	-8	-1	-2	-8	-17
22	17.7	1	12.4	-7	1	1	-3	-10
23	17.0	5	11.9	0	6	5	0	-7
24	16.2	10	11.3	9	10	6	-1	-11

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.3	26	6.4	-2	-33	...	...	...
2	8.2	17	6.3	-3	-30	...	...	...
3	11.5	14	8.6	9	-4	-20	...	...
4	17.5	13	13.6	16	12	5	-6	-20
5	21.5	10	16.4	11	13	10	3	-6
6	23.2	9	17.6	8	13	11	8	-2
7	23.5	8	17.6	7	12	11	6	-2
8	22.3	8	16.7	7	11	9	3	-4
9	20.2	8	15.1	8	10	7	0	-10
10	17.6	9	13.2	10	9	3	-7	-20
11	14.6	11	10.9	11	4	-5	-20	-38
12	12.1	12	9.0	9	-3	-17	-38	...
13	10.1	17	7.6	6	-14	-34	...	...
14	9.2	24	6.8	2	-24	...	...	...
15	8.7	28	6.4	0	-30	...	...	...
16	8.6	30	6.3	-1	-32	...	...	...
17	8.7	32	6.5	0	-31	...	...	...
18	8.9	32	6.6	2	-28	...	...	...
19	8.8	32	6.5	2	-28	...	...	...
20	8.9	32	8.6	1	-29	...	...	...
21	8.3	33	6.3	-3	-37	...	...	...
22	8.1	33	6.3	-4	-39	...	...	...
23	9.2	32	7.0	4	-24	...	...	...
24	8.5	33	6.5	-1	-33	...	...	...

VK WEST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.4	11	17.7	16	17	15	8	0
2	24.8	11	18.6	16	18	16	10	3
3	25.6	11	19.7	17	20	17	12	4
4	25.6	11	19.2	19	21	18	13	5
5	24.3	13	18.3	23	22	19	11	2
6	21.8	16	16.5	29	24	18	8	-3
7	18.8	20	14.2	31	22	12	0	-16
8	16.0	24	12.1	29	16	4	-13	-33
9	13.6	27	10.3	25	8	-7	-29	...
10	11.5	30	8.6	18	-3	-23	...	...
11	10.3	32	7.7	13	-12	-36	...	...
12	9.7	33	7.2	9	-18	...	...	...
13	9.3	34	6.9	6	-23	...	...	...
14	9.1	34	6.7	5	-25	...	...	...
15	9.2	34	6.9	6	-23	...	...	...
16	9.5	33	7.0	8	-20	...	...	...
17	8.8	35	6.7	3	-28	...	...	...
18	8.5	35	6.6	1	-31	...	...	...
19	8.7	34	6.7	2	-28	...	...	...
20	8.7	26	6.7	0	-28	...	...	...
21	10.5	20	7.7	9	-11	-31	...	...
22	14.2	17	10.9	17	6	-6	-24	...
23	18.3	14	14.0	18	14	7	-4	-18
24	21.5	12	16.4	16	17	12	4	-5

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.5	14	11.8	15	11	4	-7	-21
2	15.6	7	11.8	5	6	2	-7	-19
3	18.4	5	14.5	-2	5	4	0	-8
4	21.7	6	16.5	-9	3	6	4	0
5	23.4	6	18.0	-13	2	6	5	2
6	23.6	5	18.5	-14	1	5	5	2
7	24.1	4	18.1	-13	1	4	4	0
8	21.9	4	16.4	-9	2	4	2	-3
9	19.1	3	14.3	-4	3	2	-2	-10
10	15.8	2	11.9	0	2	-2	-11	-23
11	13.1	1	9.8	2	-1	-9	-23	...
12	10.9	1	8.2	2	-7	-20	...	...
13	9.8	5	7.3	1	-14	-32	...	...
14	9.3	12	6.9	0	-20	...	...	...
15	9.2	20	6.8	0	-25	...	...	...
16	9.3	25	6.8	1	-26	...	...	...
17	9.6	27	7.1	4	-23	...	...	...
18	9.8	29	7.4	6	-21	...	...	...
19	9.5	29	7.2	4	-24	...	...	...
20	8.9	30	6.8	-1	-33	...	...	...
21	8.7	30	6.7	-2	-35	...	...	...
22	10.5	28	8.2	10	-14	-38	...	...
23	10.7	28	8.3	12	-10	-32	...	...
24	14.7	20	11.1	21	10	-1	-18	-37

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.7	12	19.0	15	19	17	12	4
2	25.3	12	19.4	13	18	17	12	6
3	24.7	13	19.1	11	17	16	12	6
4	24.5	12	18.8	10	16	16	12	5
5	24.7	13	19.1	11	17	16	12	6
6	25.4	12	19.4	13	18	17	13	6
7	25.3	12	19.3	16	20	18	13	6
8	24.1	13	18.4	20	21	18	12	3
9	21.9	15	16.7	25	22	17	7	-3
10	19.2	20	14.5	34	23	13	-1	-18
11	16.6	21	12.7	30	15	1	-18	-39
12	14.3	22	10.9	23	3	-15	...	...
13	13.0	23	9.9	17	-6	-28	...	...
14	12.1	24	9.2	12	-14	-39	...	...
15	11.6	24	8.8	8	-20	...	...	...
16	11.3	24	8.6	6	-24	...	...	...
17	11.1	24	8.4	4	-26	...	...	...
18	11.2	24	8.5	5	-25	...	...	...
19	10.3	25	7.9	-2	-37	...	...	...
20	8.8	25	6.8	-20	...	...	...	...
21	8.5	26	6.6	-25	...	...	...	...
22	11.5	18	8.7	5	-19	...	...	...
23	17.1	14	13.3	19	11	1	-13	-31
24	22.1	13	17.0	18	18	14	6	-3

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.0	6	18.2	-14	1	5	5	2
2	23.8	9	19.1	-9	5	9	8	5
3	22.6	12	18.1	0	10	12	11	6
4	21.4	15	17.0	9	15	15	11	5
5	20.6	19	16.3	18	20	18	12	4
6	19.9	23	15.7	27	25	20	13	3
7	19.0	26	15.4	33	28	21	12	1
8	17.9	27	14.0	35	26	18	6	-7
9	16.0	26	12.0	31	19	8	-8	-26
10	13.2	29	9.9	25	9	-6	-28	...
11	11.1	31	8.3	17	-4	-24	...	...
12	9.9	32	7.4	11	-13	-37	...	...
13	9.4	30	7.0	8	-18	...	...	...
14	9.1	19	6.8	5	-17	-39	...	...
15	9.3	12	7.0	5	-13	-33	...	...
16	9.6	4	7.2	4	-9	-25	...	...
17	9.9	-2	7.5	3	-6	-19	-39	...
18	9.6	-9	7.3	2	-5	-17	-35	...
19	8.9	-19	6.8	1	-5	-17	-34	...
20	8.8	-34	6.7	-5	-11	-21	-39	...
21	10.7	-17	7.9	-2	-1	-8	-20	-35
22	14.8	-5	11.4	-7	0	-1	-8	-17
23	19.1	1	14.6	-13	0	2	0	-6
24	22.3	4	17.0	-16	0	3	3	0

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE ACT

● YAESU FT 747-GX $800; MFJ Versatuner III, MFJ 962C $300; DRAKE SSR1 comm Rx $450; RTTY converter home brew, $50; NATIONAL Panasonic tape recorder $50; TRIO-KENWOOD oscilloscope 15 MHz, $300; G4PMK SPECTRUM Analyser, home brew, $50; RF Sig Gen $100; ICOM IC22 VHF FM, xtals for Packet, $100; DICK SMITH UHF Explorer $100; KENWOOD KP202 2 m FM hand held, $200. Chris VK1DO (06) 290 1448 A Hrs.

● KENWOOD TS530S HF xcvr s/n 2040356 with hand mic, instr manual, orig pkg, exc cond, has had well below average use, $600. Warwick VK1AWH QTHR (06) 286 4232.

● ICOM IC730 HF xcvr and hand mic, good cond, w/s manual, exc mobile/first rig, s/n 01923, $550; YAESU FT102 HF xcvr, good cond, spare finals, hand and desk mics, s/n 081036, $700. Both items ONO. Richard VK1RJ, QTHR (06) 258 1228.

FOR SALE NSW

● ICOM IC730 HF xcvr, exc cond, never been mobile, s/n 03700, $650 ONO; VK2ELS QTHR (02) 875 2958.

● YAESU FTV-700, 70 cm/10 m transverter, ALC amp s/n 3M02006 & P3M090026, Cables, Manual, orig carton, purchase docs, $350-00. Hans VK2AOU QTHR (02) 539789.

● YAESU FT 212RH 2m 45w mobile xcvr with 5/8 ant, EC, s/n 2D880338, $400. Paul, VK2PAU 1 Blaxland Pl, Glenhaven NSW.

● YAESU FT200 wkg order but needs some attention, suit restorer or useful for spares, $150; DSE EXPLORER 70cm FM xcvr, VGC, S/N 6300338, $150. Peter VK2BEU QTHR (02) 872 3381.

● ICOM IC 735 HF xcvr, c/w mic, manual and access, $1000; ICOM PS55 PSU $400. YAESU FT7B HF xcvr $500; YAESU FL2000B HF linear amp, $1000; KATSUMI 150 Iambic keyer $200. Elsie (047) 741 084.

● HEWLETT PACKARD VTVM model 410B, DC to 1000V, AC to 300 V, to 700 MHz, as new with manual, $149. VK2CPK (02) 605 4790.

FOR SALE VIC

● EIMAC 3-500Zs (pair), as new, used sparingly, $195. Roth VK3BG (03) 725 3550.

● SCHEMATIC/PCB program, suit most requirements, incl auto place, auto route and auto transfer from schematic to PCB, complete with orig manuals, professional package, $250-00. VK3XBA (03) 872 3411.

● KENWOOD TS520 and extension spkr, full serv man, $550; Set of YAESU mobile whips 3.5, 21, 28, 144 MHz, $30. VK3SM (03) 386 4406.

● COLLINS HF receivers, rare 51S1 exc cond, $1100; 390A HF, exc cond, $950; 51J4 Rx, exc cond, $400. All GWO with instr books, Rob VK3JE (060) 371262 or (03) 584 5737.

● DECEASED ESTATE of the late VK3WT. YAESU FT101Z with digital dial fitted, exc cond, $500; TRIO comm Rx, model JR60, $100; NALLY tower, tilt over, two section, complete with rotator and triband HF beam, buyer to remove, exc cond, $1000; KEN KP202 2m handheld, $50; also SWR meter, GDO, headphones etc. Contact Trevor (03) 726 0831.

● EXPANDED SCALE voltmeter, lead-acid cell tester 1.8V 2.8V, master instruments type CT74, $20 posted. Terry VK3ZXY, QTHR (03) 592 3514.

● AWA VHF low band xcvr, 2 ch xtal cont FM mode, valve construction, operates off 12 VDC, with cct diag, suitable for 6m conversion, no xtals, $25; REALISTIC SCANNER pro2010, covers 8 bands, 68-88 MHz, 118-136 MHz, 148-174 MHz, 380-450 MHz, 450-470 MHz, 470-512 MHz, AM/FM full scan facilities, 20 mem ch, op manual, 240 VAC desktop model, VGC, $350; VHF xcvr valves 6BH6, 6AU6, 6AK5, 6AK6, 12AX7, 12AT7, EC4, 6C4, 6T6, 6AJ8, 6BD, 1U5, above $5 ea. Tx valves QQE03/12, $14 ea. Suitable as spares or replacements. Vincent VK3AJO QTHR (03) 872 3503 A Hrs.

● AMPLIFIER Hybrid Public address with two dynamic mic and aux inputs, 50 w output, box three spkrs, $100. VK3DPO QTHR (03) 857 5342.

● SATELLITE Rx kU band NEC 1022a, exc for receiving Aussat or 10 GHz and 1.2 MHz FM ATV experimentation (requires simple sound board, cct supplied), $75; PLESSEY 12A LNC $15; Low noise Maspro LNC 1.5 dB, $35. Neil VK3BCU (03) 390 2609.

● ICOM IC 701 xcvr with matching PSU, SM2 Desk mic, ICOM Hand mic, DC pwr lead (unused), 24 pin outlet plug with pins (unused), IC EX2 extension terminal with 100 kHz marker, dual acc outlets, headphone jack and linear cont relay (plugs into 701), manuals, ccts for all with collected info, as new cond, upgraded station, $1200 complete; HALLICRAFTERS rx mod S38A, 1.6 — 30 MHz in 4 bands, sep bandspread dial, 110 V, black metal case with inbuilt spkr, $200. VK3DS QTHR (053) 323 226 evenings.

FOR SALE QLD

● KENWOOD xcvrs, valves, Bird 43 pwr meters, ICOM xcvrs, CBs, and access. Test equipt, coax cable, bits and pieces. Location Lot 2 Markwell rd, Caboolture QLD 17th July 1993 (Food) 8.00 am. (Contact Redcliffe repeater), Fred VK4DY (074) 961186.

● KENWOOD R820 comm rx, digi read out, IF shift, notch, PBT, matches TS820/TS520, VGC, $500 ONO; YAESU FR8800 gen cov rx, 2-30 MHz, incl FM, band scan, memories etc, exc cond, $800. Steve VK4KHQ 018 743 231, or inspect at 59 Albion Road, Albion Brisbane during office hours.

● ICOM IC-720 xcvr, incl PSU, new "Hamtenna" multiband vert ant, manual, $850. Selling as returning to G4. VK4CAF QTHR (070) 536 492.

WANTED NSW

● YAESU transverter FTV 901 or FTV 107 in good wkg cond. Richard VK2CRB (02) 548 1451 A Hrs or (02) 874 0122 Bus Hrs.

● MILITARY RADIOS AR-17, 108, 1009, 208, 11, 19, 22, B-40, R 1155, T 1154, Hallicrafters S-27 and/or S-27D. CIRCUIT diags and/or manuals for the above sets and B-41 Rx, 62 set, University Super Tracer — AST, ACE Radio wideband oscilloscope, AWA gated amp type A55765 and AEI HV PSU tye R1103A. Photocopies OK. John Farmer (02) 888 9411 (BH/AH).

● SERVICE MANUAL or CCT diag for PCM FM3400 UHF repeater, all reas costs paid. Ian VK2AIJ QTHR (048) 232 562 (W), (048) 21 6806 (H).

WANTED VIC

● TWO EIMAC type HR-6 heat dissipating anode connectors; two EIMAC type SK-406 glass air system chimneys, and a KILOVAC vacuum relay with one c/over contact set. Details and prices to Roy, VK3ARY QTHR (03) 807 4798.

● SPECTRUM Analyser to around 1 GHz. Peter VK3BPN QTHR (03) 580 9518 BUS, (03) 551 7346 A Hrs.

● OCTAL valves for vintage radio restorations. Types ECH33, EBF35, EL3N, EL33, fair prices paid. Terry VK3ZXY QTHR (03) 592 3514.

WANTED QLD

● ICOM IC202 2m, working or not. Reas cond, David VK4DH QTHR (073) 789 868.

● ICOM IC211 or similar VHF multi mode set, cheap 20 MHz CRO or similar. Tech books or manuals, valve data etc. VK4YFF (070) 317895 (Cairns).

● AC POWER CABLE or power plug to suit FT-101E. Keith VK4BKM QTHR (074) 86 4340.

WANTED WA

● INFORMATION, assistance, any help, hints, how to wind multi band whip antennas. Terry VK6NTJ QTHR. (Editor's Note: Terry, if all else fails, please refer to the WIA Divisional Bookshops advert in this issue, for information on books available in respect of this matter .. VK3UV, Production Editor).

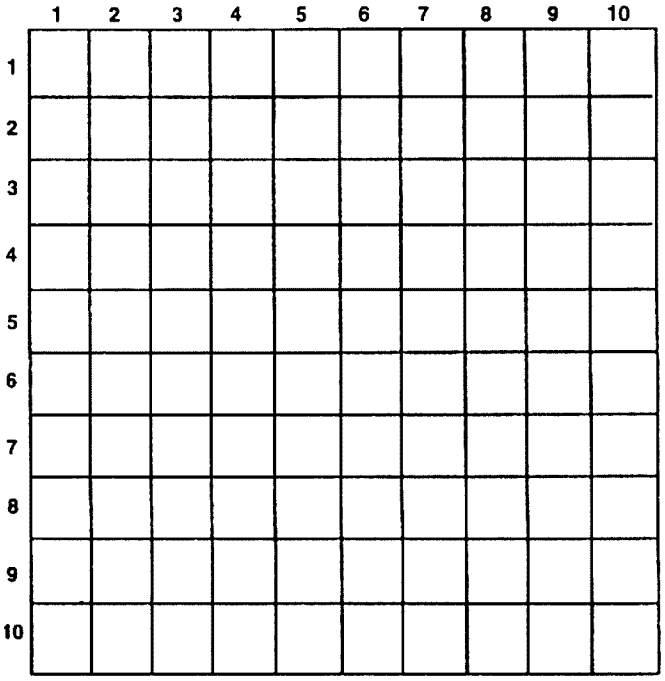
MISCELLANEOUS

● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

ar

Morseword 75

Solution Page 56



Across:
1 Memento
2 Akubras
3 Fish
4 Chairs
5 Outlook
6 Meetings
7 Slackened
8 Quagmire
9 Part of a church
10 Short yelp

Down
1 Dray
2 Submerge
3 Scottish dress
4 Sketched
5 Sovereign
6 Correct
7 Monster
8 Awkward
9 Stupid
10 Reason

Entries for 1994 Call Book close 31st July.

Is your current entry correct?

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
•Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
•Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
•Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
•QTHR means address is correct as set out in the WIA current Call Book.

•WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
•Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958
MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members" amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

Trade Hamads

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

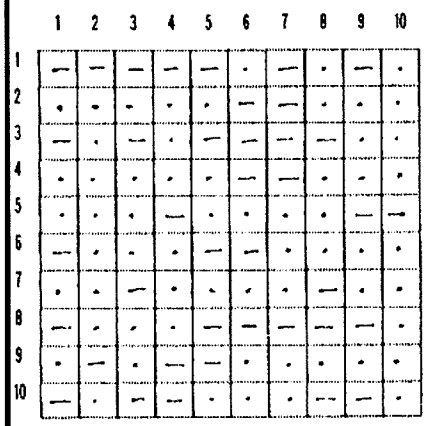
VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

Solution to Morseword 75

Page 55



Solution to Morseword 75
Across: 1 Token; 2 Hats; 3 Cod; 4 Seats; 5 View; 6 Dates; 7 Eased; 8 Bog; 9 Apse; 10 Yip.
Down: 1 Cart; 2 Dive; 3 Kilt; 4 Drew; 5 King; 6 Amend; 7 Ogre; 8 Inept; 9 Daft; 10 Sense.

Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

Introductory Price

$399

Cat D-3600

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

Icom's impressive range of receivers lets you listen to more frequencies, across the band and around the world.

Starting with one of the smallest receivers ever produced, the IC-R1 covers 100kHz - 1300MHz (2 ~ 905MHz guaranteed), with AM, FM and Wide FM modes, Dual Frequency Selection and 100 memories.

The IC-R72 receives 30kHz - 30MHz (100 kHZ ~ 30 MHz guaranteed) in SSB, AM and CW modes and comes with numerous impressive features, including Icom's DDS System to improve Carrier to Noise Ratio characteristics and optional FM mode.

IC-R9000

With an Icom receiver, the world is as wide as your band

The mobile IC-R100 is packed with powerful features, and covers the 100kHz - 1800 MHz (500 kHz ~ 1800 MHz guaranteed) range in AM, FM, wide FM modes with multi-function scanning and 100 memories with 20 scan edge channels.

While the IC-R7100 covers from 25 ~ 2000 MHz in SSB, AM, FM, wide FM modes, optional TV and FM stereo adaptor, with 900 memory channels, sophisticated timer functions and multiple scan functions.

The top of the range IC-R9000 expands your listening horizons, covering 100 kHz ~ 1999.8 MHz in all modes and featuring Icom's unique CRT display, intelligent scan functions and an amazing 1000 memory channels, in a unit that delivers superb high frequency stability, even in the GHz range.

So tune in to the ones that professional listeners use, from the wide range of Icom wide band receivers.

IC-R7100

IC-R100

IC-R72

IC-R1

For further information call free on (008) 338 915
or write to Reply Paid 1009 Icom Australia Pty Ltd
P. O. Box 1162 Windsor Victoria 3181
Telephone (03) 529 7582 A.C.N. 006 092 575

ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.

L L BROWN ADVERTISING 3907

AMATEUR RADIO

JULY 1993
Volume 61 No 7

Journal of the Wireless Institute of Australia

- Ferrite Choke Baluns
- Enhance the FT-411E
- Mini Packet Modem
- Review: SmartLog

KENWOOD

...pacesetter In Amateur Radio

Compact Milestone

Kenwood unveils the world's smallest HF transceiver

HF is going places—thanks to Kenwood's new TS-50S, the smallest transceiver of its kind in the world. Providing high-performance communications with go-anywhere convenience, the TS-50S is your passport to freedom. And whether used for mobile operations and DX-peditions, or in a fixed installation, this rig packs a powerful punch. Maximum output is 100W, and there's a full range of advanced features—including 100 memory channels, DDS with innovative "fuzzy" control, and AIP for superior dynamic range IF shift and CW reverse mode help reduce interference, while a noise blanker improves clarity. For user-friendly operation on the move, there's a multi-function microphone and powerful menu system. And the TS-50S is fully equipped for split-frequency operations. Test drive one today.

TS-50S
HF TRANSCEIVER

NEW

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD
(ACN 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre
Homebush, NSW 2140, Australia Tel (020 746 1519
Fax: (02) 746 1509
NSW Emona Electronics Sydney (02) 211 0988
Lake Macquarie Communications Cardiff (049) 567 255.
ACT Watts Communications Fyshwick (06) 280 6416
QLD Kenwood Communications Albion (07) 357 6830
VIC Strictly Ham Bayswater (03) 729 7656, Stewart
Electronics Components Huntingdale (03) 543 3733.
SA International Comms Systems Port Adelaide (08) 473 618
WA Leda Electronics St James (09) 381 7821
Tower Communications, Victoria Park (09) 470 1118
TAS Elgin Pty Ltd Launceston (003) 312 711,
Elgin Pty Ltd Hobart (002) 344 5000
FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 61 No 7 ISSN 0002-6859 July 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3ARZ
Editor
Bill Rice VK3ABP
Production Editor
Bruce Bathols VK3UV
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
Brenda Edmonds VK3KT
June Fox
CIRCULATION
Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 526 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
August	12/7/93	14/7/93
September	9/8/93	11/8/93
October	6/9/93	8/9/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover
The new WIA Federal President Kevin Olds VK1OK finds a little time in his busy schedule to actually sit in front of the rig !

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service
Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

FEDERAL QSP

This month finds me at the keyboard having just returned from New Zealand and the 67th NZART Conference where the Federal Vice President Neil Penfold VK6NE and I represented the WIA. It was an interesting experience seeing how our friends from across the Tasman go about their annual conference. We were able to attend the meeting of their Council as well as their Annual General Meeting and associated activities.

NZART is organised along very different lines than the WIA, being structured around branches, of which there are approximately 80, compared with our seven divisions. Of interest, however, were the similarities in the problems and issues which face amateurs in both countries. During its council meeting, many of the problems being addressed were the same as those addressed by the WIA's board, often with the same lack of answers. Problems of membership and finances beset us all, and not just in the amateur radio movement.

One very different aspect of the New Zealand scene is the management of the frequency spectrum. A much more commercial orientation exists within the administration, and it was useful to talk to a representative from the Radio Frequency Service, the equivalent of DoTC, during the conference.

The Minister of Communications, the Honourable Maurice Williamson, opened the conference, and his description of the government's attitude to the radio spectrum made interesting listening. The New Zealand government sees the radio spectrum as a resource to be managed, in much the same way as land is managed. There are commercial pressures which see parts of the spectrum sold to commercial interests for use under prescribed conditions. However, there are also community interests that must be served with land which requires the creation of parks and sets aside land for recreational and community purposes, so parts of the spectrum are set aside for community use. It is in this category that amateur radio falls in the view of the New Zealand government, and so its bands are preserved.

Such an attitude on the part of the government is of benefit to the Amateur Radio Service, and the NZART is indeed fortunate its government holds this view. It is an attitude which we need to foster in Australia. In the same way that there are legitimate reasons for preserving land for recreational and community purposes, so there is a case for preserving radio spectrum for the same reasons. However, in saying that, the same applies to us as to land usage — if we don't use our bands and allow them to fulfil the recreational purpose for which they have been established, then others will find a better use. The age-old cry is still just as valid today — use them or lose them.

Kevin Olds VK1OK, WIA Federal President
ar

Mini Packet Modem

*Eric van de Weyer VK2KUR * joins the Packet revolution with this incredible project.*

The following is a description of a mini modem for use with Baycom, SP or GP software (there may be others but the above are the only ones I know of at the moment).

This modem is a combination of ideas from several sources including Tom Moffat's Pocket Packet described in November 1992 and January 1993 Electronics Australia, Poor Man's Packet from August 1991 73 Magazine and The ZL Packet Radio Modem in November 1992 Break-In.

My first dabble into making my own modem was in January 1992, a couple of weeks after Dave VK2KFU introduced me to Poor Mans Packet (PMP) during a lecture he gave at our local radio club on getting into Packet Radio. I am no newcomer to Packet having been using the mode for about four years now but was on the lookout for something small to use for portable operation (I have been Aeronautical Mobile on packet).

Dave furnished me with a copy of the article on PMP and a copy of the software. I lost little time putting together the Modem on a piece of veroboard in a small plastic box and got it up and running without any problems. When I told Dave this, he commented that he thought I was going to build it into a DB25 backshell . . . so I did, complete with a 5 pin DIN socket on the back for the connection to the radio. I found a couple of drawbacks with the PMP modem, however. One was the fact that it had to run on the Parallel port of the computer, this meant that I couldn't use the printer with it except by saving everything to a log file and then printing it out afterwards. The second problem was that, running on my XT style Laptop, every time when packets were being received, I had to stop typing as the poor processor couldn't handle the keyboard simultaneously. Running it on a faster (286) machine, it did not exhibit this second problem.

In November of last year, EA ran the first of the two articles from Tom Moffat on his Pocket Packet which really got me interested again in the concept of a Software TNC type of

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts		1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $86.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Bob Lloyd Jones Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2YEL	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK5	*South* Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 148.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to ***Australian resident*** (F) (G) (X) grades at fee x 3 times.

packet setup. I eagerly awaited the second article from which I set about and built up the modem. I had in the meantime ordered and received a copy of Baycom 1.5e through the local agents, AAPRA. The modem worked first time and, although I still had a minor problem because of the computer speed, its operation was satisfactory. The main problem was that for anything but the short packets, it tends to take many retries to get them through. When tested on my 486, however, it worked perfectly.

Having now built the Moffat/Baycom modem, I was shown an article in November 1992 Break-In (NZART) by Ron Badman ZL1AI and Tom Powell ZL1TJA called the ZL Packet Radio Modem. This unit is essentially the same as the Baycom and PMP modems using the same main IC, the TCM3105 and a hex inverter but with the addition of an MAX232, RS232 to TTL level converter IC. This is a brilliant chip having on board two transmitting inverters and two receiving inverters, as well as two power inverters which, with the addition of four external capacitors, provide plus and minus 10 V supplies with a single plus 5 V input. Its total current drain from the 5 V supply is about 5 mA. The ZL circuit used the MAX232 for receive data and transmit data to and from the computer as well as for PTT from the computer.

I had at this point decided to put together a printed circuit board for the project, with the aim of putting a PC mount DB9 at one end, a PC mount 5 pin DIN at the other end and the rest of the bits in between. As it stood, I needed three ICs. Could this be reduced to two?

The three ICs I was looking at were

1. The TCM3105 FSK Modem IC
2. The MAX232 interface IC
3. A 4049 or 74HC04 basic hex inverter IC.

The first one I needed, the second I wanted to present the correct levels to the serial port of the computer. Could I do away with the hex inverter?

I decided that I could get rid of it if I were to leave out the transmit timeout facility as the transmit and receive data were already being inverted by the MAX232 and a simple transistor change would work for the PTT line. The only other place an inverter was needed was between pins 2 and 5 of the TCM3105 to invert the clock pulses but that could be done with just a transistor and a couple of resistors as it is in the PMP modem. Thus it was that I eliminated the hex inverter chip.

As I thought about it, it suddenly dawned on me that there was still one inverter in the MAX232 not being used. It is a TTL in RS232 out one and I wondered if I could use it in the same sort of circuit as the original timeout circuit, which uses two inverters.

I lost no time in breadboarding it up, noting that the input to the inverter has a 400 K pullup resistor, which is a lot lower than the 3.3 M used in the original. I only needed to put in a larger capacitor and hey presto, it worked. As it turns out, the timing seems to work out as being one second for every ten micro-Farads therefore, a value of 220 μF results in a 22 second timeout, more than adequate. This is what I settled on as I didn't have any 150 μF caps in stock (the original timeout is about 14 seconds).

After this initial success, I decided to breadboard the rest of the modem on the same piece of socket strip and,

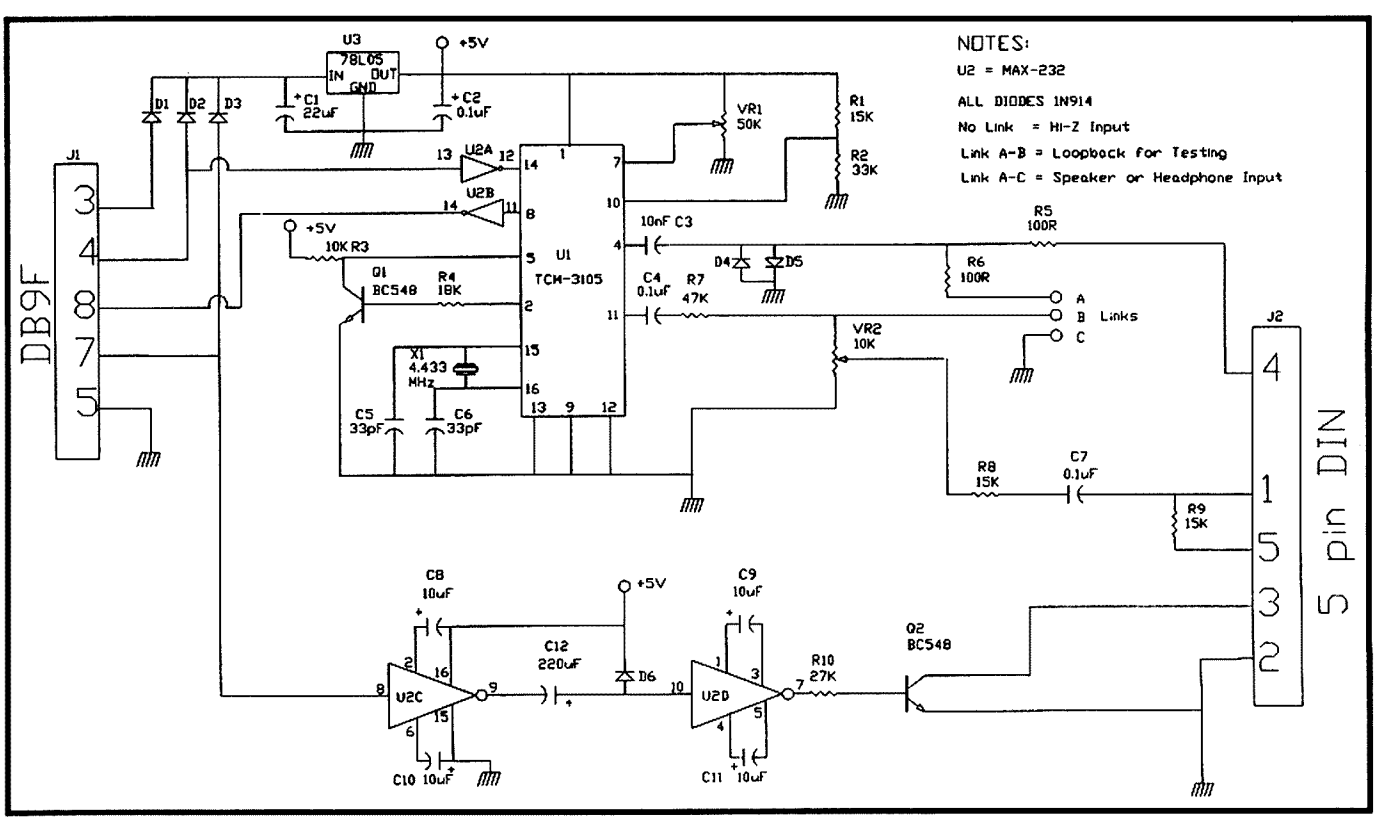


Figure 1 Full circuit diagram.

when plugged in, it worked perfectly. It still has the slight problem with the PC speed and retries on the laptop, but on the faster machine it works very well.

So now we come to the construction and the PC board. I will not include a description of how the device works as it can be got by reference to any of the articles referred to at the beginning of this article.

I started by drafting out the new circuit so that I could see what I really had to work with (see Fig 1). From this I designed the printed circuit board which, in its first incarnation, turned out to be a bit long to fit into any boxes I had available, so I redesigned it to shorten it so that it would fit in one of the little plastic zippy boxes available at Dick Smith and others (see Fig 2 and Photo).

The actual construction is quite straightforward, there are no hidden tricks, no links to forget and, when finished, there should be no spare holes.

Most of the components are not very critical with all the polarised capacitors except the 220 μF timing capacitor, C12, being a small electrolytic while all the others are tantalum. Make sure that C12 is as small as you can find so that it will fit in the space on the board. The two trimpots are multiturn, which makes for much easier adjustment although the adjustments are not all that critical. The 10 K (VR2) is the audio level out to the transceiver while the 50 K (VR1) is the receiver threshold adjustment. I have found that on all the units I have built to date that if I set both of the pots to their mid position, the unit works straight away and can then be adjusted for best results.

The most expensive part of the whole unit is the TCM3105 chip, which, from Farnell Electronics cost around $23.00. The next are the MAX232 and the 4.433619 MHz crystal. Not everyone stocks the 5 pin DIN PCB mount socket but both Altronics and Rod Irving have it in their catalogues.

Probably the best method of construction would be to put in all the small components first, then the larger ones followed by the two ICs and finally the two sockets although this is not necessarily the way I did it when I made mine. I found that the right angle DB9 connector for the computer would just fit into the 0.8mm holes I had drilled in the board but I needed to use larger ones for the DIN socket and the 3 pin header for the jumper. All the resistors except R10 (27 K) are mounted vertically on the board.

The purpose of the jumper is to either have a high impedance input from the receiver if taking the audio from somewhere like the volume control hot lead, this is with no jumper installed. If running the unit from the audio output of the transceiver, putting the jumper to the ground side (towards the outside edge of the PCB) provides a load for the output stage. The other position provides a loopback from the output of the TCM3105 back to the input for testing purposes. This can be used for setting up the receive threshold if some way of providing a 50% duty cycle input to the TCM3105 is available.

During the prototyping of the board I tried a different method of producing the PCBs. It was suggested by Glen Andersson from Ashfield NSW in the February 1992 Silicon Chip magazine. The board was designed using Easytrax and a printout done on a laser printer. The printout was then laid onto the cleaned copper of

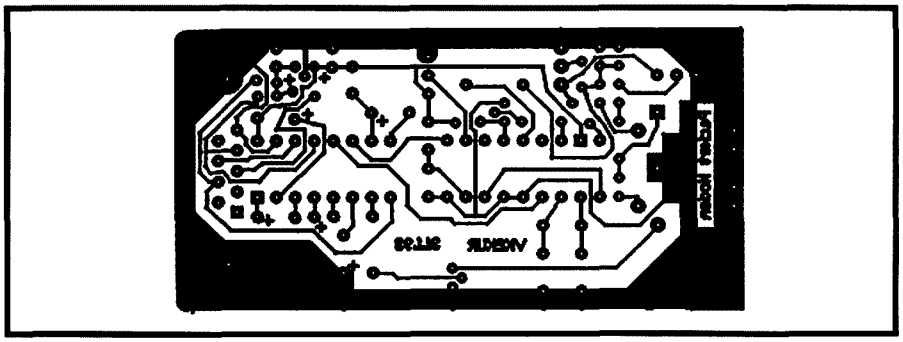
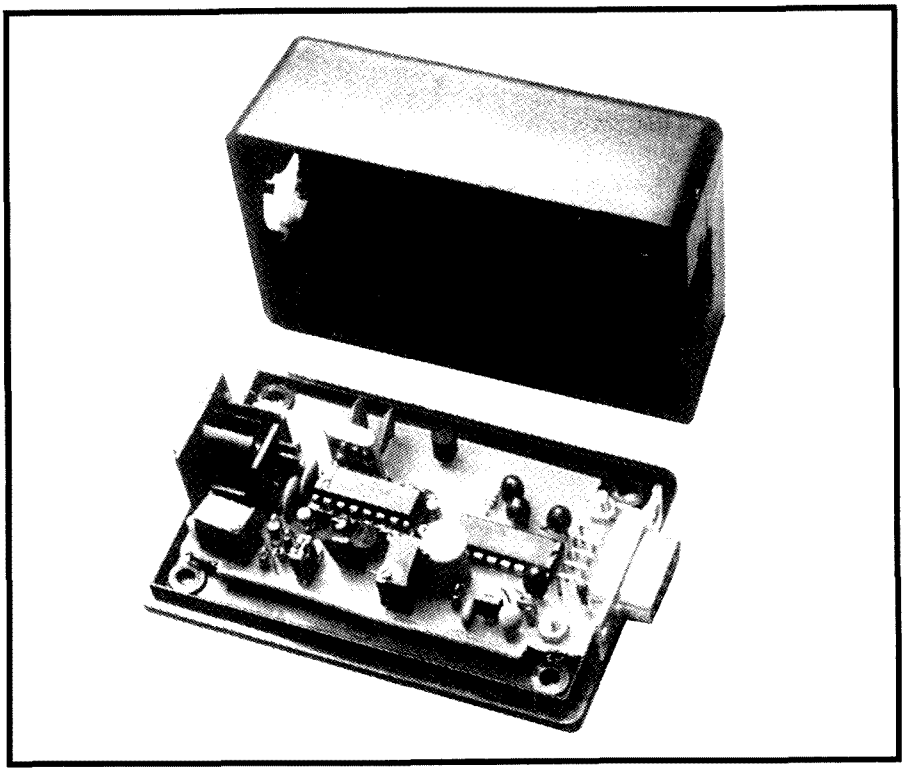
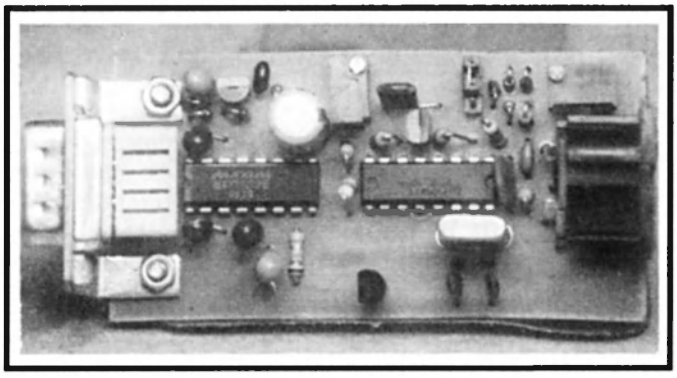


Figure 2 Actual size PCB pattern viewed from component side.



Overall view of the Mini Modem mounted in the zippy box.



View of the Mini Modem showing component locations.

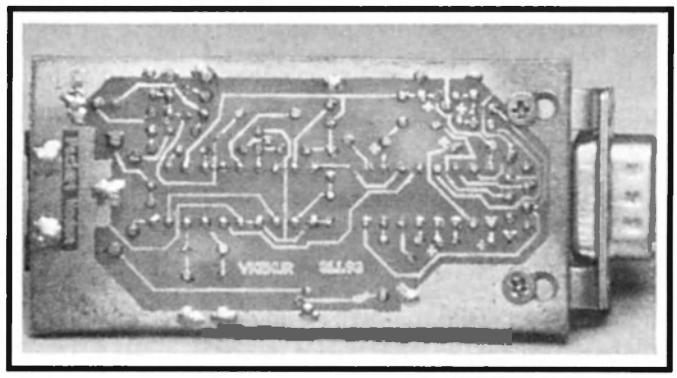


Photo showing underside of PCB.

the board and ironed on with a normal iron set to "cotton". Once the board had cooled, it was put into warm water for a few minutes to soak. Once removed, the paper was carefully peeled off, leaving the image on the board. The toner of the laser print is an excellent resist and I only had to touch up in a few spots to get very acceptable results. See photo. The only chemical involved in the whole process is the actual etchant with the whole process taking about 15 minutes from printout to finished board.

Please note that the connections for this modem to the computer do NOT use the normal transmit and receive data lines. Also, the 5 pin DIN connector uses the same pinouts as many common TNCs such as the Tiny-2 and TNC-220 and I think many others.

I hope that this article is of use to some of you and it also proves that there are some of us out here who still tinker around and build things.

Components List for the Mini Baycom Modem

Capacitors

C1	22 μF 16V Tantalum
C2	0.1 μF Monolithic
C3	10 μF Greencap, Ceramic etc.
C4	0.1 μF Greencap, Ceramic etc.
C5,C6	33 pF Ceramic
C7	0.1 μF Ceramic etc.
C8-11	10 μF 16V Tantalum
C12	220 μF 16V Electrolytic

Resistors

R1	15 K 0.25W
R2	33 K 0.25W
R3	10 K 0.25W
R4	18 K 0.25W
R5,R6	100 Ω 0.25W
R7	47 K 0.25W
R8,R9	15 K 0.25W
R10	27 K 0.25W
VR1	50 K Multiturn pot
VR2	10 K Multiturn pot

Transistors etc

Q1,Q2	BC548 etc.
D1-6	1N914, 1N4148 etc.
U1	TCM-3105 FSK modem chip
U2	MAX-232 RS232 to TTL level inverter
U3	78L05 low current voltage regulator.
J1	DB9M Right angle PC mount connector
J2	5 pin DIN right angle PC mount connector

Crystal

X1	4.433619 MHz Crystal (PAL colour burst)

Miscellaneous

3 pin header and jumper
Printed circuit board.

* *48 Cambridge Avenue, Vaucluse NSW 2030*

ar

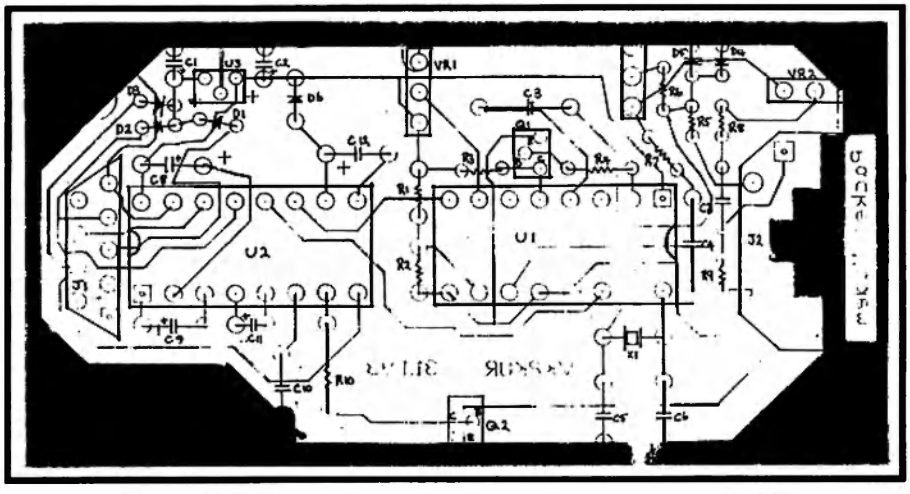


Figure 3 Component overlay viewed from component side.

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

Profile of a President — Kevin Olds VK1OK

Kevin's interest in amateur radio was kindled in 1978 when he decided to get a licence and get into the interesting stuff he'd seen his father do for many years. He passed the theory and regulations in 1978, and held the limited call VK1ZAD until finally passing the morse code and obtaining his full call in 1980. Since then he has pursued his interests as time has permitted. He is interested in the technical side of the hobby, and enjoys home construction of equipment and accessories. On-air activities have included rag chewing, packet radio, computers in amateur radio and ATV. Much of the equipment he uses for packet and ATV is of the home-built variety.

His involvement in the non-radio side of the hobby commenced in 1980 when he joined the ACT Divisional Council as Treasurer, a position he held for six years. That was followed by two years as the ACT Division's Federal Councillor.

Much of the equipment he uses for packet and ATV is of the home-built variety.

Kevin served on the then Federal Executive in the role of ACT Division's Federal Councillor when the Executive was first restructured. Following retirement as Federal Councillor he continued to serve on the Executive until it contracted into the present Board in 1992. At that time he assumed the role of WIA IARU Region III Liaison Officer, having been part of the WIA delegation to the IARU Region III meeting in Bandung in October 1991.

In his working life he is an Information Technology Consultant, being part owner of the firm for which he works, mainly in consulting to Federal Government Departments.

His station today comprises a Yaesu FT990 HF transceiver with Yaesu FL-2100B Linear for those hard times, a Yaesu FT625R all-mode for six metres, Icom IC211 all mode for two metres and Icom IC390 all mode for 70cm. Icom and Kenwood handhelds and mobile rigs complete the radio side. The major antennas are a TH3 JR tribander for the higher HF bands and an inverted vee for 40 metres. Az-El mounted 2m and 70cm antennas double for satellite and terrestrial work.

The major items on the home-built front are a spectrum analyser covering up to 500 MHz, a VADCG TNC+ with 300, 1200, 4800 and 9600 home-built modems, RTTY and Amtor units, ATV transmitter, 1 GHz frequency meter and sundry other items. **ar**

Ferrite Choke Type Baluns

by the late Clive J Cooke VK4CC

The use of ferrite beads threaded on to appropriate conductors of offending appliances to reduce RFI has been with us for some time now. However, very little information has been published in Australia on the use of ferrite beads in constructing baluns for use in antenna design, though the trend overseas is to favour that type in preference to the toroidal transformer type whenever that is possible. The ARRL in fact now actively discourages the use of the transformer balun as may be inferred from the note on pages 28-18/19 of the 1992 (16th) edition of the ARRL Antenna Handbook.

Two excellent articles on the use of ferrite bead baluns have been written by Walter Maxwell (QST March 1983) and John Belrose (QST June 1991). Belrose gives constructional information of 1:1, 4:1 and 9:1 choke baluns as shown in diagrams below. At this juncture it should perhaps be explained that the ferrite mix used in suppression and choke balun application differs considerably from that which should be selected for toroidal transformer applications. The latter must have high resistivity and inductivity, whereas the former must have low resistivity and inductivity to quickly absorb induced eddy currents from RF currents.

A feature of the baluns described by Maxwell and Belrose which did not appeal to me was that their choice of beads necessitated the use of smaller than usual diameter coaxial cable such as RG174 or similar, which in turn had to be joined in series with the larger diameter coaxial cable used in an antenna installation. I therefore decided to take a risk after consultation with the Sydney-based office of Neosid Australia P/L and ordered a quantity of its 7 Mix ferrite rings under the code name of 28-013-27, and also a lesser number of model 28-033-27. The 28-013-27 rings fit nicely over RG58CU cable, and the larger 28-033-27 slips over 10mm diameter cable such as RG213.

Editors' Note — This article was in the final stages of preparation for publication when Clive Cooke passed away, With the permission of Clive's family, we have much pleasure in publishing his final work in the interests of the hobby, which I am sure Clive would have wanted ... Bill Rice VK3ABP, Editor.

Construction

In the construction of a 1:1 balun I took the risk of using only 30 beads and, of course, 60 beads for a 4:1 balun. Test results have been outstanding; in fact, with 50 watts into the 4:1 balun using a 200 watt non-inductive resistive termination absolutely zero reflected power registered on the SWR meter. Testing of the 1:1 balun is not quite as simple as will be understood if the article by Belrose is read. It requires the use of a centre-tapped 50-ohm resistor, something which I could not acquire. However, "scratch" tests of the balun connected to a twin transmission line satisfied me that both sides of the line were indeed "hot" even though one side was connected to the earthed braid of the balun. It is now in service on an experimental two-element "log cell" two-band beam.

The 4:1 step-up balun is now used between my unbalanced output ATU and a twin line feeding a 40m horizontal quad loop fed at one comer for all band operations with much success. No longer do I cause loss of colour in our main TV set when I am on the 3.5 MHz band, indicating a definite improvement in line balance compared with the previously used toroidal 4:1 step-up balun. The transmission line of the TV receiver is fairly close to that used for transmission purposes at one point.

At this stage the larger 28-033-27 rings have not been placed into service, but it is believed that 10 of those larger rings will be adequate for use on any tri-band beam, and might even be satisfactory for the lower bands, though one should be prepared to add more beads if necessary.

Afterthoughts

The results are really outstanding and I now use a 1:1 and a 4:1 setup in my antenna system. The first for a two element Yagi, and the other for feeding a tuned line with an ATU for all band operation of a 7 MHz horizontal loop.

When I ordered the beads, on advice from Neosid, I also ordered a quantity of larger diameter beads intending to try them for performance on the larger diameter 10mm coaxial cable, such as RG8.

I have only just discovered that the diameter is far too much in excess of what I consider to be required for the job to be done with them, so after recent telephone discussions with Neosid, I have been assured that the smaller diameter ferrite ring having the code name/number of 28-522-27 will do the job nicely. It has an inside diameter of 12mm, so is just right for 10mm coax.

Therefore, in light of the foregoing, for RG58CU type coaxial cable, use Neosid type 28-013-27, and for the larger diameter cable such as RG8 having 10mm diameter, use Neosid type 28-522-27 ferrite rings.

The 28-522-27 are enamel covered. I believe 30 beads would be required for a 1:1 balun over the range of 1.8 to 30 MHz. Probably 15 would be sufficient for a beam 14 to 30 MHz. Double the quantity for a 4:1 balun of course.

At the time of purchase the smaller rings cost me 59 cents each, plus 30 per cent ST, plus $5 packing and postage, being $27 for a 30-bead balun which, considering its efficiency compared with a toroidal cored transformer type, is, in my opinion, very reasonable.

It should be clearly understood that I have not undertaken tests at VHF or UHF, for which a different mix might be required as with the Amidon brand. My tests have been solely for HF use.

Choke Balun

In reference to the use of a choke balun on a G5RV type antenna which was featured in AR December 1992, I was interested to note that the article was more like an advertisement for the product of VK6BIL than information of practical use to amateurs.

Bill VK6BIL has since written to point out that he is not acting as an agent, and sent the information for general consumption. He uses one of these baluns with great success. We apologise if the publication gave an incorrect impression.

The type of ferrite material, model and manufacturer etc was not disclosed, nor was any reference or credit for the design given to the originators of the idea, who as far as I know were Walter Maxwell and John Belrose. (Refer QST March 1983, pp 38, 39, 40 for article by Maxwell, who has published a book available from Stewarts for about $40). The article by Belrose VE2CV is, in my opinion, more enlightening as a follow-up to the information given by Maxwell. Refer QST, June 1991 for full article, pp 30, 31, 32, 33. In the latter article the construction of, not only a 1:1 choke balun is given, but also a 4:1 and a 9:1 choke balun. All VERY informative, I found, and as a result, unless I am after a ratio other than one of those, I am henceforth committed to the use of "choke" type baluns instead of ferrite toroidal types. I am more than satisfied with results, to the extent even of using the beads directly over the coaxial line feeding my two-element home-brew trapped rotary beam. Not even bothering to use a high grade Japanese rod type sent to me as a gift from Japan.

I have spent approximately $300 acquiring the correct type of ferrite material beads for HF band operation, and have had lengthy and costly telephone discussions with the supplier of the ferrite rings — Neosid, Australia Pty Ltd. The address is 23-25 Percival st, Lilyfield, NSW 2040. I have presented many of my amateur friends with samples for trial in Japan, USA and UK.

Just slip them on and secure in position with a couple of plastic tie strips. No need for any SO239 connector which becomes necessary, of course, if one uses the smaller diameter coax used by Maxwell, such as RG274 etc.

The testing of the effectiveness of a choke balun becomes complex in the case of the 1:1 choke balun, as the terminating resistor must be centre tapped and earthed back to the main earth system. the 4:1 step up (50/200 ohms) is easier to test as it only needs one 2000 ohm non-inductive resistor. Over the entire range 1.8-30MHz, no reflected power at all on the SWR meter and, as I said in my article, it cured my 80m TVI problem by balancing tuned line from ATU more accurately than I could obtain with transformer (Voltage) toroidal types. One has only to recall just how precise one must be in adjusting for balance of carrier suppression in a SSB rig to appreciate that the rather rough windings of a toroidal transformer would be unlikely to give perfect balance to earth on each side of CT. I used to lose the colour in our TV set when I transmitted on 80 metres, and also picked up some line oscillator from the TV in my receiver.

Not now though. In fact I have also plastered the TV feedline input with these "worry" beads just to make sure. The feedlines are in proximity to each other. Note I did not say CLOSE proximity. What else is there other than CLOSE proximity. DISTANT proximity??? Hi!!!

It concerns me that some amateurs might purchase the incorrect ferrite material and be disappointed with the results. There is an important difference between the material intended for use as a transformer and that used for suppression purposes, such as is required with the choke balun. By the way, I used 30 rings for the 1:1 balun, and of course 60 and 90 for the higher ratio baluns. That gave me 1.8-30 MHz coverage nicely, though probably 15 rings would do for a 1:1 for 14-30 MHz. I have not delved into the VHF types to use at this stage. For the choke balun and for suppression bead purposes, Neosid has a special mix F7, an addition to the suppression bead range. For suppression purposes the ferrite mix materials must provide for high initial inductance (Li) and LOW resistivity. In material used for transformers, the Li is not quite as high, according to my information, but resistivity is high over a much higher frequency range than the supression type. The idea is that for suppression purposes the relatively low resistivity more readily "consumes" the eddy currents; quite an involved arrangement, and many pitfalls for the unwary.

So, if you wish to obtain a Neosid range for your information the cost to me was 59 cents each plus 30 per cent sales tax, plus $4 packing and postage for the smaller rings, and the larger rings cost me 89 cents plus ST and postage as above. I do not think you would have any problems getting them direct from Neosid, though they guard their specs pretty closely. Hil I spoke to Paul Michaelis who runs the show.

I would not consider "potting" the beads. Capacity might be a problem, and they do not like too much heat if it is surrounded with epoxy curing. The G5RV against ground might be okay if the feedlines were parallelled and fed against ground. ar

Enhanced Receiver Performance of the FT-411E

*Lew Whitbourn, VK2ZIP * describes an enhancement to the receiver front end.*

The Yaesu FT-411 hand held was the first of the very small full featured 2m FM hand helds and came onto the market in 1988 or 89, and has been very popular ever since. It has been widely reviewed, in AR in June 1989 and January 1990 and in Amateur Radio Action Vol 12, No 3 (11 July 1989).

With a simple modification available at Dick Smith Electronics its receiver coverage can be expanded to 130-174 MHz. In my review in AR in January 1990 I showed its measured sensitivity and image rejection over this full range of frequencies. Its sensitivity was somewhat less than flat over the full range and, because of the very broad receiver front end, it exhibited some overload problems.

The FT-411E was released early in 1991 and boasted enhanced receiver performance. In a review in Amateur Radio Action (Vol 14, No 5: 3 September 1991) Tom Moffat alluded to the flatter sensitivity curve and improved strong signal handling of the FT-411E. In this article I show the measured performance of the FT-411E receiver. It is so much better than that of the FT-411 that I actually bought one!

Figure 1 shows the sensitivity to signal and image frequencies of the original FT-411, as published in AR in January 1990. I show the image at the actual frequency where it occurs, to demonstrate that the receiver front end does not have any variable tuning. As a result the image curve(s) are continuous extensions of the main sensitivity curve, as shown in the figure. The image is broken into two parts, one overlapping the top end of the tuning range of the radio from 164.600 MHz to 191.595 MHz and the other overlapping the bottom end, from 122.4 MHz to 139.4 MHz.

This is a consequence of the receiver switching from high-side injection to low-side injection at 156.995-157.000 MHz. (A detailed explanation is given in the original review). As the figure shows, the sensitivity is not very flat over the full 130 to 174 MHz range and the image rejection is not very good outside the primary 144-148 MHz range of the receiver.

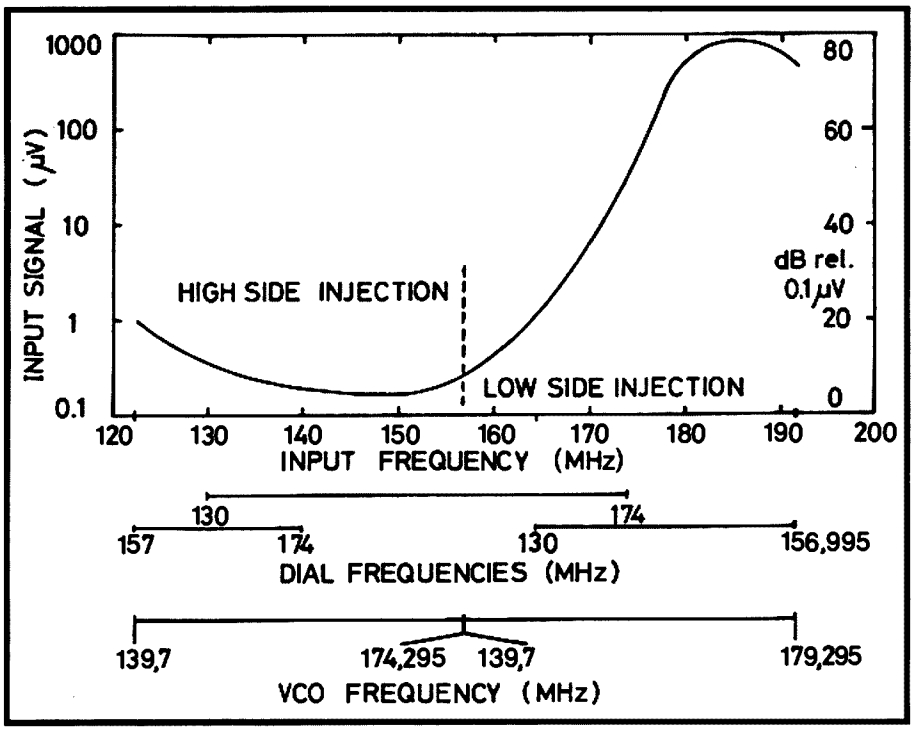


Figure 1 — FT411 Receiver Sensitivity

Figure 2 shows the corresponding sensitivity to signal and image of the FT-411E. A number of important differences are immediately apparent. Firstly the sensitivity is much flatter over the full 130-174 MHz range. Indeed the sensitivity is better than 0.3 μV for 12 dB of noise quieting for all frequencies between 137 MHz and 174 MHz and is still 0.6 μV at 130 MHz. Secondly, the image curves are no longer continuous extensions of the main sensitivity curve, showing that there is some tuning taking place in the receiver front-end, and the image rejection is generally somewhat better. Thirdly, there is a small jump in sensitivity as the receiver tunes from 156.995 to 157.000 MHz, showing that there is some switching in the front-end selectivity circuit as the radio jumps from high-side to low-side injection.

I compared the circuit diagrams of the FT-411 and FT-411E to understand how the improved performance is achieved. The small jump in sensitivity as the radio tunes from 156.995 to 157.000 MHz shows that it still switches from high-side injection to low-side injection in the same place. A slightly increased first IF frequency, up from 17.3 MHz to 21.7 MHz, pushes the image frequencies further out from the main tuning range of the radio, which improves image rejection somewhat. Also, my subjective assessment is that overload performance is improved, so possibly the 21.7 MHz crystal filter is of slightly better quality than the original 17.3 MHz unit. The remaining improvement to explore is the flatter sensitivity from 130 MHz to 174 MHz.

I started out looking for track tuning of the receiver front-end filters but was disappointed. What I found was diode-switched lumps of capacitance to two of its three front-end helical filters, which are switched in for frequencies below 156.995 MHz and switched out for frequencies above 157.000 MHz. I don't fully understand the circuit and the extra capacitance may be that of the diodes themselves,

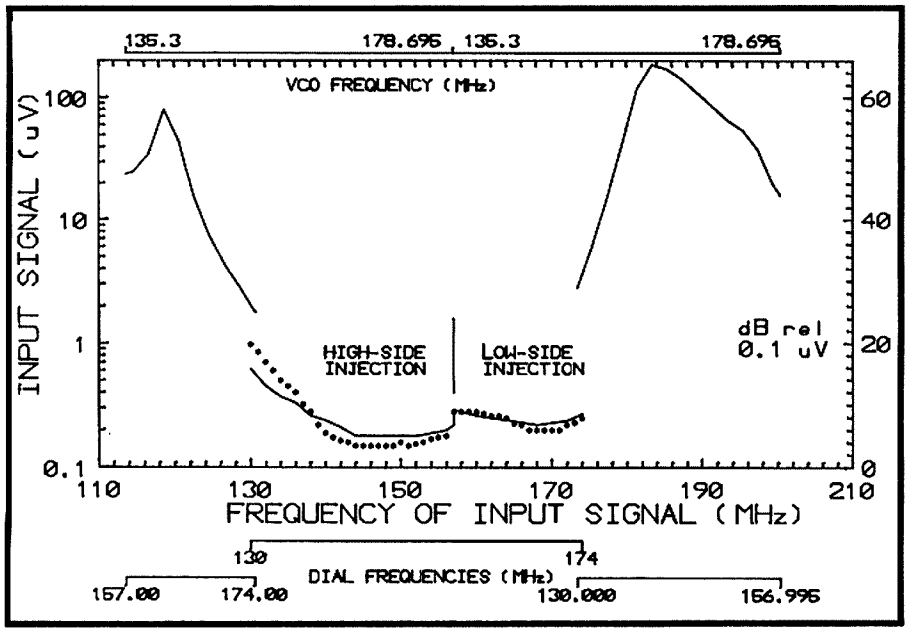


Figure 2 — FT411E Receiver Sensitivity

each being half of a type ISS184 twin diode package. This switched capacitance is what causes the small jump in sensitivity at 157 MHz. So the FT-411E front end now covers the 130 to 174 MHz range in two pieces, 130 to 157 MHz and 157 MHz to 174 MHz, making it easier to achieve flat tuning over the full range. This would also contribute to strong signal performance a little, because at any one time the receiver is looking at only half the 130 to 174 MHz range with full sensitivity. This simple trick substantially improves the performance of the FT-411E, without the complication of implementing full track tuning.

As always the sensitivity measurements that I show here are signal level required to produce 12 dB quieting of the receiver. This is an easy measurement requiring a signal generator and a simple audio millivoltmeter. It would be better to do SINAD measurements, which are generally what the manufacturers specify, but I do not have access to a SINAD meter. However, I have always believed that the signal required for 12 dB quieting would not be much different from that for 12 dB SINAD, or 12 dB signal to noise plus distortion, for a well aligned receiver (eg a new one).

I had a chance to check this hypothesis when Chris Ayres from Dick Smith Electronics gave me a copy of DSEs SINAD measurements for an FT-411E, which I show plotted as points in Figure 2. There is very close agreement between the curves for 12 dB SINAD and 12 dB noise quieting, as expected. To be completely honest, I should point out that these two sets of measurements were done on two different radios. There is a small chance that these two radios had different sensitivities and that the SINAD and noise quieting measurements just happen to be the same, but this is very unlikely to happen so accurately over such a wide frequency range.

I think it is more likely that this comparison shows that different radios are very similar to each other and the two measurement methods also give very similar results! This is not to denigrate the value of SINAD measurements, which are vastly superior for receiver adjustment purposes. It is possible using an audio millivoltmeter to adjust the crystal filter matching circuits of a radio to give fantastic receiver quieting figures, only to find that the resulting IF bandpass characteristic is far from flat and gives terrible distortion of recovered audio!

The SINAD measurement, working with a sine-wave modulated signal and measuring both noise and distortion, does a much better job of optimising the overall performance of a receiver.

Since I mentioned the manufacturers specifications I should say that the FT-411E has a guaranteed sensitivity of better than 0.158 μV for 12 dB SINAD (144-148 MHz). The DSE measurements show 0.15 μV and my measurement in this frequency range was 0.18 μV for 12 dB noise quieting.

Birdies

Every broadband receiver has some birdies — where it hears weak signals from its own frequency generation and control circuitry. I have started counting birdies from different receivers to allow some quantitative comparisons to be made. The number of birdies encountered obviously depends on the frequency step size and the squelch setting in use. Here are some typical results, obtained by letting the radio scan from 130 to 174 MHz with the antenna disconnected.

Squelch at threshold
— 5 kHz steps : 23 birdies
— 25 kHz steps : 10 birdies
Squelch tight
— 5 kHz steps : 7 birdies
— 25 kHz steps : 3 birdies

The three strongest birdies are at 166.950 MHz, 171.400 MHz and 173.350 MHz. These are all well out of the amateur band. There are no birdies between 142.750 and 148.600 under any circumstances.

Conclusion

The FT-411E leaves little to be desired in a 2m FM hand-held. It is due to be replaced by the FT-415, which is a little smaller and has a number of new features, which are listed below:

1. A (top-mounted) external power socket and associated battery charging capability.
2. DTMF paging facilities.
3. A choice of either indefinite or momentary display and keyboard lighting.
4. Less memories (41 instead of 49 with the FT-411E).
5. Correct ARS (Automatic Repeater Shift) for the Australian 2-metre bandplan, which can be disabled.
6. Four power levels: 5 W, 3 W, 1.5 W and 0.5 W (with 12 V supply).
7. Optional BUSY light disable.
8. Intelligent battery saver which adjusts saver cycle time according to current pattern of usage.
9. CTCSS scan with optional FTS-17A module.
10. Better audio.
11. Track tuned front-end.

If the last FT-411Es are cleared out at bargain prices they will be worthy of very serious consideration by users who decide that they don't need all these new features. One issue, possibly the most important issue for city operators and irrelevant for country operators, is receiver quality. Although I said above that the overload performance of the FT-411E was much better than that of the FT-411, please note that I did not say that it was excellent.

Although I am very happy with my FT-411E (and I live in Sydney) I am aware of its limitations. Its receiver is not always happy if connected to a base antenna or to a roof-mounted vehicle antenna in the city. The reason is probably that it has a very broad front-end and uses bipolar transistors rather than dual-gate FETs in its RF amplifier and mixer stages. Some other handhelds do better in this department. Indeed, in a recent comparison of ten 2 m handhelds from five manufacturers in QST (October, 1992) the FT-411E was found to be by far the worst for 3rd order intermodulation distortion, to the extent that QST measured two units to make sure that the measurement was right, while the FT-415 was found to be about average, which was quite acceptable.

I still wonder whether they got it right because they also found receiver sensitivity outside the two meter amateur band to be inferior, which does not agree with the measurements shown in Figure 2 (also for two different transceivers) and would be more consistent with my earlier measurements on the FT-411 (Figure 1).

Despite these quibbles, it does seem likely that the FT-415 will have better overload performance than the FT-411E. The recently released FT-26, which replaces the FT-23, was reported to have very acceptable overload performance in a recent issue of ARA (Vol. 15, No. 8: November 92). Study of the circuits of the FT-415 and FT-26 shows that they have identical front-ends, using a single 2SC4537 bipolar transistor RF amplifier with four track-tuned filters feeding a 2SK882Y J-FET mixer to a first IF of 17.7 MHz. This looks better than the front-end of the FT-411E. So, for those needing better overload performance than that of the FT-411E, the FT-415 could be well worth waiting for.

Technical Editors Note

Whilst sensitivity is important the strong signal performance is also very important. Intermodulation, blocking, and cross-modulation are very important parameters. This is especially so in the larger cities and many other places where a handheld radio may be expected to operate.

Many amateurs suffer disturbances from other services. Services operating on adjacent allocations often produce very high signal strengths. Consider also the plight of operators living close to beacons, repeaters, and packet BBS's.

The problems of interference or disturbance from adjacent strong signals are well known. in Nov 1992 QST Dr Ulrich Rohde DJ2LR/KA2WEU noted that the dynamic range required for VHF/UHF receivers may well be higher than for HF receivers.

Hopefully with the increasing problem of strong signals the equipment manufacturers will move to address the problem. Techniques exist to solve many of the problems.

* *PO Box 218, Lindfield, NSW, 2070.*

ar

WIA News

No Plans for VHF Pagers

In March, the Federal WiA's Secretary/General Manager, Bill Roper VK3ARZ, queried the (then) Department of Transport and Communications' future plans for the Paging Service which uses the band from 148 to 150 MHz.

A reply from Alan Jordan, of DOTC dated 10th May said that the Department *"...has no plans to make any changes in the short term to the Paging allocations as detailed in VHF High Band Frequency Band Plan. (Statutory Rules 1991 No.354)".*

Alan Jordan, who is director of DOTC's Technical and Operational Policy and Procedures Section of the Radiocommunications Operations Branch, qualified his reference to "short term" by saying that it *"...should be interpreted as 'not precluding changes in the long term' rather than 'there are changes planned for the long term'."*

So, our two metre repeaters and transceivers which use the top end of the band will have to co-exist with paging services on 148-150 MHz for the foreseeable future.

Software Review
SmartLog Logging Program

Evan Jarman VK3ANI gives his unbiased review of a computerised log book, and it looks most respectable.

Every amateur should keep a log of activity. Most prefer to keep more than the regulations require; generally for uses other than satisfying the radio inspector. Entering contacts in a log book is a minor part of their function. Once recorded, information must then be found when needed.

It is in the area of information retrieval that computers excel, in fact it would be their major commercial use. Radio logs are a data base and so can be treated like any other data base by a computer. There have been quite a few programs to computerise radio logs (some published in the pages of this magazine) but most neglect to use a computer's ability to sift, search, sort and merge information. It is a shame to neglect this capability; after all computers are the servants of mankind, never the other way round. Commercial data base programs are big business and are therefore quite elaborate. This enables them to be tailored for any system including a radio log, but this would be a waste of money, and effort.

SmartLog is a data base program written to give many data base facilities to the radio log. It is a program whose operation is similar to commercial software such as Lotus Symphony. It is DOS based and accepts single key instruction: it does not use a mouse. Single key instructions generally mean that typing the first letter of a instruction sets the computer to work. The instructions in the menu hardly vary, so the instructions are universal, no matter where in SmartLog's fields you are. The exception being configuration which is not part of normal operation anyway. As an example to "Find" an ASCII string just type "F" and process starts. As an added advantage, a menu appears at the bottom of the screen giving most of the possible menu selections.

Operation of SmartLog, like any good data base involves linkages between items on a number of smaller lists. As an example, when a callsign is entered, the ITU callsign list is searched to find the country. So automatically the country is displayed with continent, ITU zone and even bearings to enable aerial adjustment. Operating in this way means that as things change the program can be modified to suit. The ITU radio prefix list can be modified to account for new call sign allocations as they occur: which is frequently. The system is dynamic, not rigid, and so is not rendered obsolete by change.

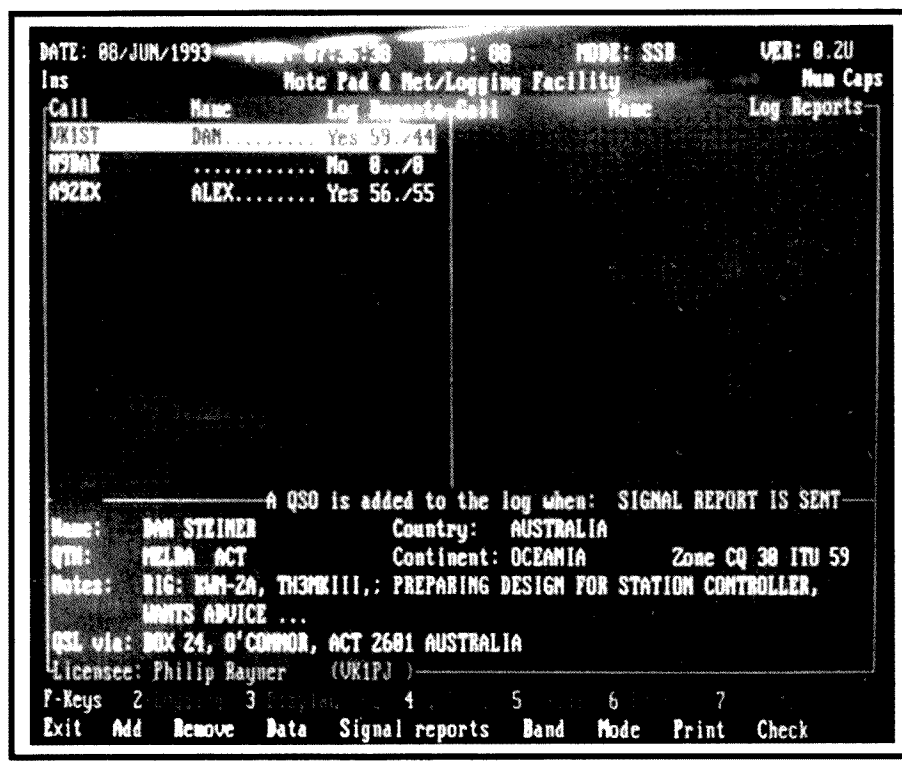
The authors have put a good deal of thought into writing this log program to tailor it for amateur usage.

SmartLog can divided into three sections: data entry, data retrieval and configuration.

Log entry is by way of a note pad which enables information to be modified if necessary before becoming part of the log. No log entry is possible without a RS(T) exchange being recorded. The program keeps a check on notepad entries to ensure complete recording before notepad entries can be transferred to the log. Incomplete records are an enormous problem when retrieval is attempted. It means that you can only guess what a value should be, which is generally unacceptable.

The program handles items such as QSL sent/received and stores QSL manager information. A number of award codes can also be entered, the use of which is covered later.

Retrieval of information is the main purpose of any log. If no one was to read the log, why keep one? SmartLog uses the computer's ability to process information to make retrieval much more "user friendly". The whole log can be sorted chronologically (normal log book style) or alphabetically using the call sign entries. The latter is especially useful for finding the exotic callsigns or grouping together stations of



SmartLog Notepad and Net/Logging Facility showing entered details.

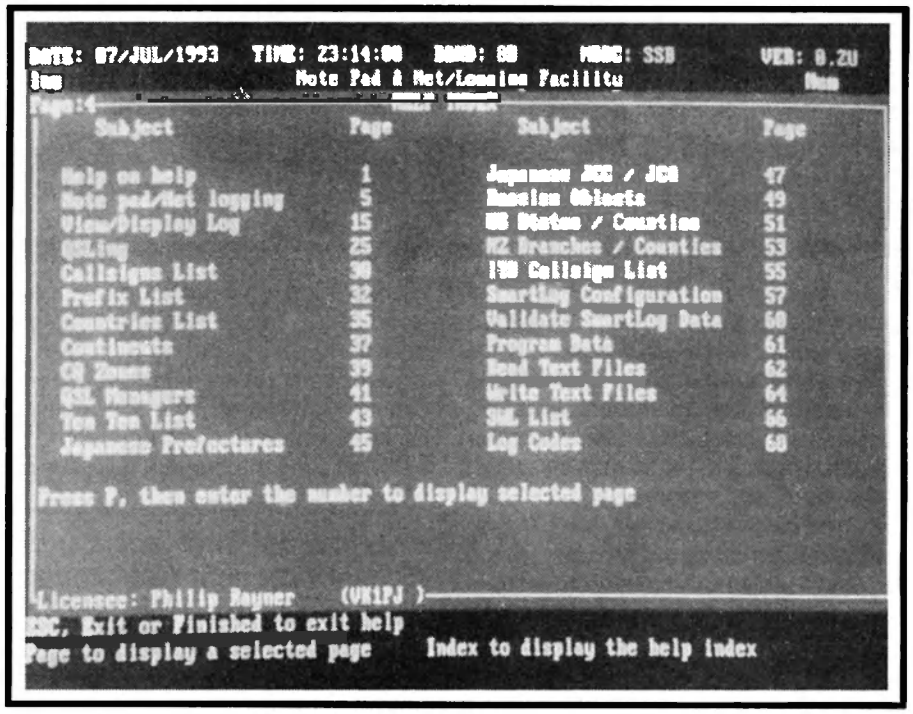
common callsign prefix. All done at the push of a button. Also available is a "Find" option which must be one of the best functions invented. It allows you to search through the entire log looking for a string of characters. It searches character by character until it finds the sequence of characters that you specify. The log entry is highlighted and the program asks if you wish to continue or not. This is wonderful for finding that DXpedition station where the country prefix is actually a suffix. It may not seem much but when a log starts to get to any reasonable size, you appreciate the effort it saves. If your log contains the odd thousand entries or so, you consider nominating the person who thought of string searches for a Nobel prize.

A very nice addition for award seekers is a matrix display which gives an immediate indication of stations worked. The columns display the bands worked with the rows listing the stations worked. There are three ways of sorting the stations: callsign, country, or callsign prefix. If there is a station logged the letter "L" appears at the intersection of row and column. Should a QSL card be recorded the flag displayed is "LQ". It gives an immediate indication of that much needed contact and QSL card needed to complete an award. Conversely the gaps or needed stations/countries are immediately apparent.

SmartLog also stores additional information for some specific awards. These are WAS/WAC for US stations, JCC/JCG and prefecture for Japanese stations, TenTen data, NZ Branch/County for the stations across the Tasman and Oblasts for CIS stations. Changes in the CIS recently indicate the necessity of having a modifiable log program.

SmartLog can be configured to suit different taste in screen colours and the essential parameters used by the program and station (GMT off set and location) so suiting most peoples' tastes. Full backup facilities are available; the log can be written on a printer or disk file and read from disk. Any one working with computers can testify to the wisdom of keeping backup files on a floppy disk.

The only disadvantage would have



Comprehensive help index.

to be the tolerance of the computer to the RF of the transmitter when operating the two together. Hardly a fault of the software.

SmartLog requires just under 1.5 MBytes of disk space plus room for the log data. It can operate with either monochrome or colour monitor and is generally as responsive as a word processor. The only time the processor speed can be noticed is during validation of the log data which only needs to occur when the program's checking routine notices a missing link in the data base. During my tests this never occurred.

The program comes with a help screen feature. By pressing the first function button (F1), the options currently available are shown. This saves diving for the manual if you are unsure of what to do next. Once familiar with the program, the help feature is rarely touched, but it's still nice to know it's there.

Conclusion

The authors have put a good deal of thought into writing this log program to tailor it for amateur usage. The log examination routines are good for finding just what you are trying to find; which is the purpose of keeping a log. It is not just something to file and forget.

SmartLog is available at $49-95 complete, including postage. To order send your name, callsign and cheque to Philip Rayner, VK1PJ, 33 Willoughby Crescent, Gilmore ACT 2905.

A demonstration disk of the SmartLog program which will allow up to 50 log entries is available for $6-00, including postage.

Editor's Comment

Recent enhancements to SmartLog now enable summaries for Worked All Continents, All Zones (both CQ and ITU Zones) and DXCC; as well as the US States/Counties, Japanese and New Zealand areas previously mentioned.

SmartLog also allows the direct input of data from computer files. For example, SmartLog can "read in" existing computerised log data if it is presented in ASCII and formatted properly. Similarly, SmartLog can "write" selected information to ASCII files, which could then be used in other programs, such as word processors for special presentations etc.

The software is intended for use on IBM compatible personal computers, preferably an 80286 CPU or later. It runs best if installed on a hard disk drive. **ar**

Technical Abstracts

Gil Sones VK3AUI

Product Detector

A recent QST article by Dr Ulrich L Rohde KA2WEU/DJ2LR in QST Nov 1992 included a different product detector with extra dynamic range. The product detector used CMOS switches to demodulate the SSB IF signal and the dynamic range claimed was 25 dB greater than a conventional design. The design requires a two phase BFO signal but this is easily provided by feeding the sinusoidal BFO into a CMOS Schmitt trigger and then into an inverter. This gives the required square wave and the inverted square wave to drive the CMOS switches.

The circuit is a sample and hold circuit using CD4066 CMOS switches. The circuit is shown in Figure 1.

The detector is followed by an active low pass filter which helps with the signal to noise ratio. Dr Rohde makes the point that the product detector makes a significant contribution to the sound of the receiver. AGC limits the dynamic range but the performance of the product detector is still important.

IF Filter Switching

In the same QST article a high isolation switch for IF filters is shown. The switching elements are FETs rather than diodes. The filters are 50 ohm input and output impedance and are 1.44 MHz crystal filters. Isolation of 90 dB is claimed. Higher frequency filters are much harder to make with stability and excellent shape factors and hence the 1.44 MHz frequency. Filters to take advantage of this degree of isolation are not cheap.

The circuit is shown in Figure 2.

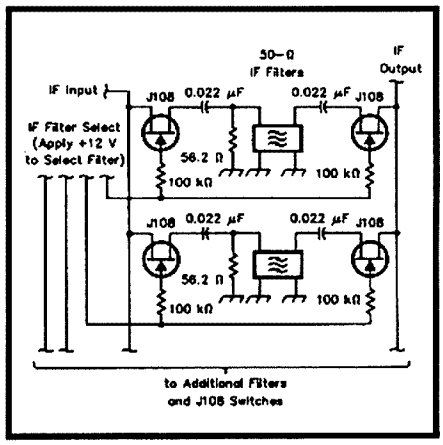


Figure 2 — JFET IF Filter Switch.

Advanced Receiver Design

The article by Dr Ulrich L Rohde KA2WEU/DJ2LR in Nov 1992 QST is required reading if you are interested in advanced receiver techniques. Also of interest are the article in Feb 1993 QST by Jacob Makhinson N6NWP on A High Dynamic Range MF/HF Receiver Front End and the articles in Aug 1992 QST and Jan 1993 QST by Rick Campbell KK7B on Direct Conversion designs. For further reading Pat Hawker had some interesting items in Technical Topics In Rad Com Feb 1993.

An interesting technique is the use of DSP to takeover many of the receiver blocks now handled by analog circuits. ar

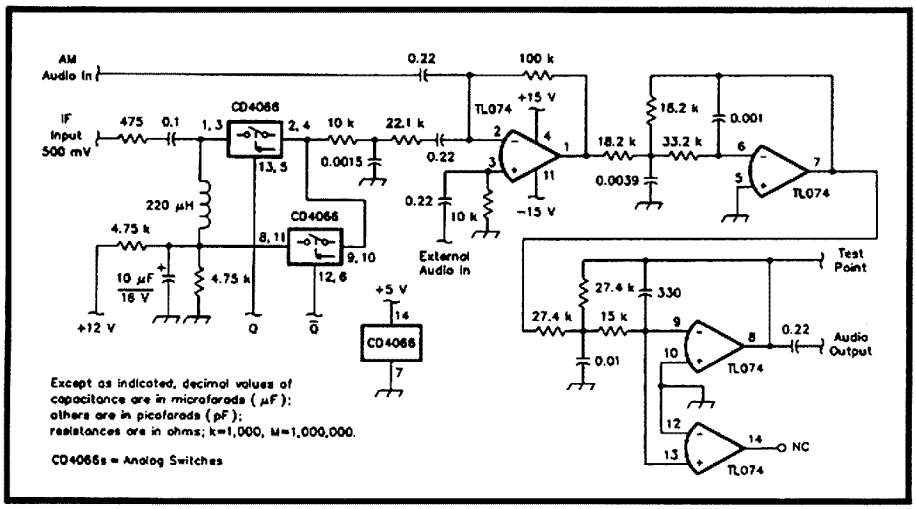


Figure 1 — CMOS Analog Switch Product detector.

WIA News

Spectrum Auction

The US government plans to auction two large segments of the radio spectrum between 1.8 and 2.2 Gigahertz (GHz).

The scheme is apparently part of a plan to cut the government's budget deficit.

The auctions have been approved by a committee of the Congress, while companion plans are passing through the US Senate.

President Clinton approves the auctions scheme, which practically guarantees they will be passed, according to reports.

The auctions are forecast to return some seven billion dollars U.S. to the American government.

Australia tops 35th JOTA Participation

With 18.8% of Scouts in the country taking part in the 35th Jamboree of the Air last October, Australia scored the highest participation rate among the 32 countries who submitted reports to the World Organization of the Scout Movement.

The Netherlands were close behind, with 14.2% of their Scouts participating. However, 17.9% of the Guides in the Netherlands took part in last year's JOTA, while 9.9% of Australia's Guides participated.

A total of over 400,000 Scouts and Guides from around the world took part.

(- from the International JOTA Report for 1992, supplied by Peter Hughes VK6HU). ar

The Story of Kingsley Radio Pty Ltd, 1938 to 1945 — Part 2

*George W Neilson VK3TES * continues his story of the development of the AR7.*

We won the contract and the first order for twenty receivers was started. The old premises at Spring Street quickly became too small as the size of the staff increased. We moved into a bigger factory in St Kilda Rd, opposite the Shrine and only one block away from RAAF Headquarters, our principal customer, who in turn were next to the Victoria Barracks, the headquarters of the Army and Navy. It is sad to realise that both the Spring Street and the St Kilda Road premises are now gone.

An early wartime story involved a young and very new digger in his brand new uniform striding purposefully from the city down St Kilda Road when he met an old first world war digger, back in uniform for a second time. He stopped him and asked:-

"Excuse me Dig, can you tell me which side is the Victoria Barracks on?"

The old chap thought for a moment then said:-

"I don't rightly know Son, but I think they're on ours!!"

With the rapid expansion of the factory and staff the boss put his secretary Mollie in charge of purchase and the store. Many materials became hard to get and Mollie had to work harder than she had ever worked before, chasing supplies. Mollie complained bitterly every time another kit of parts to make another receiver was drawn out of the store, the assembler being told how difficult it was to get these bits and how hard she had to work to get them!

Two staff acquisitions were genuine sheet metal workers, Les Eastwood and Ivan Harvey. Initially the testing of AR7s was carried out by John Bremner but later by Charles Mutton and eventually Jack Kling, two well known names in the Melbourne Radio Industry. The smooth running of the production was assisted greatly by the Aeronautical Inspection Directorate inspector Ken Boole. Tom Heywood and his mate Laurie were the core of the wiring line. Tom eventually worked in the design lab as an assistant together with Laurie Buckingham, a genius who went on to have his own business making dress sequins and later tape recorder heads!

"I don't rightly know son, but I think they're on ours!!"

During the course of the war some 3200 "AR7" receivers were made for the Air Force, Army, Civil Aviation and Dutch Navy. The Army version was designated the "Aust Reception Set No 1". The receiver and its coils were fitted to a carrying case painted in Army khaki colour and the front panel was in brass with black background to ensure minimal reflections. The power supply was mounted in a separate carrying case also in khaki. The version for the Dutch Navy incorporated a front panel with all the controls identified in Dutch.

HK, who was intensely patriotic, decided that "we" should make our own personal contribution to the war effort. He called us all together and told us that the firm would donate the materials to make a receiver and we, the troops, would donate the time to make it. As it would not be convenient for everyone to work on the particular receiver it was agreed that we would work four hours overtime for free — as we worked two nights and Saturday morning each week. We worked our free night and as I was now foreman and last out it was my job to lock up. Next morning when I arrived to open up I found the front glass doors smashed. I found that during the night there had been a fire in the factory. One of the wiremen had thrown his dustcoat on to the bench over a soldering iron. A partition was burnt but most of the damage was done by water. It somewhat took the edge off our patriotic gesture. But the Air Force did get the 1000th receiver complete with special plaque presented to them, compliments the Management and Staff of Kingsley Radio.

HK had a visit from an Army Major one day who told him that he was there in strict confidence. He was leaving the following Friday on a troop ship for the Middle East and wanted to take with him one of the Army versions of the receiver. It was impossible to get the necessary paperwork in time and he wanted the boss to supply it on trust with the paperwork turning up later. We worked every night and delivered on time. I do not know if we were paid. A couple of years later we saw this major again and asked him how the receiver performed. He gave us a funny look and told us it was left on the wharf!!

We were always getting visits from military officers with various problems. These led to all sorts of investigations and I doubt if we ever were paid for our work, usually

WIA News

Phone Scanners Banned In US

Radio scanners capable of receiving cellular telephone transmissions were banned from importation and sale in America last April by the US Federal Communications Commission (FCC).

Scanners covering US cellular radio telephone service bands of 824-849 MHz and 869-984 MHz are affected.

The ARRL attempted unsuccessfully to get specific wording that bona fide amateur equipment be exempted, but the FCC modified its rule covering converters so that it applies only to converters "designed or marketed for use with scanning receivers," according to the April *ARRL Letter.*

Converters covering the US 902-928 MHz amateur band are not affected.

including the building of prototype equipment, which often became redundant before the exercise was completed.

The Army had problems in the Western Desert with the Air Force not being able to identify friendly tanks, so many tanks were lost to our own aircraft. It was proposed that a special receiver would be fitted to the tanks, tuned to a special transmitter fitted to the planes. On seeing a tank the plane would transmit. If the signal was received by the tank the tank commander would release a puff of special coloured smoke as an identification, a unique form of "IFF". We had designed and built a prototype receiver and had it working when the project was scrubbed. Our liaison was with a Captain of the Tank Corps. On one occasion when he was visiting us he said that he was being picked up at noon. Just before the appointed hour he put overalls over his smart uniform and as we heard a great rumbling out in St Kilda Rd he proceeded to his pick-up — a Matilda Tank !

Suddenly we became aware that a machine shop was to be installed at Kingsley and we got a couple of lathes — small and large — and a shaping machine. Next we got stacks of drawings for what we were told was an "RDF" unit. We were not to know until much later but we had become involved in "Radar". The units which were made were purely mechanical, albeit UHF, being an "Aerial Switching Unit". We knew it as the "Dogbox" as the case was shaped like a kennel. Inside were two tunable co-axial cavities sequentially coupled to rotating capacitor plates motor driven with conventional automotive breaker points, cam driven, giving synchronizing signals. It was full of beautiful brass machining and screw adjustments.

Sometime in 1941 the Government notified us of a requirement to manufacture polystyrene in Australia. Again in hindsight I guess this was precipitated by the advent of "Radar" although at that time it was top secret. HK decided that we should get into the making of polystyrene and Noel Featherstone — an old friend of HK, at one time involved in the manufacture of resistors at Continental Carbon — and George Bennett from Sydney, both industrial chemists, came to work for us. They set about designing a pilot chemical plant for that purpose. Before this project reached the testing stage Taubmans in Sydney went on-line and our project was dropped.

. . . we heard a great rumbling in St. Kilda Road. He proceeded to his pick-up, a Matilda Tank!

About the same time Kingsley was having some difficulty in getting adequate supplies of iron cores for the coils. A separate company called Metals Disintegration Pty Ltd was set up and work was started in developing a manufacturing process to make iron cores. The process consisted of taking iron oxide powder called Haematite and reducing it in a muffle furnace at 800 degrees C in the presence of hydrogen. This removed the oxygen leaving iron powder, which was then pounded in a ball mill and mixed with dissolved polystyrene as a binder. Dried and further milled it was compressed in hot dies in an eight ton pressure hydraulic press to make the cores. Unfortunately the ratio of iron to binder was low and while the cores were useable they were not very satisfactory.

The iron cores which were being used in the receivers were manufactured by a small company in Melbourne. They started to have difficulty in keeping up supply and I believe that Kingsley invested some money in the company. As things did not improve Kingsley took over the company with its process and some of its staff. It is interesting to compare this process with the previous one.

The raw material was iron powder. This was obtained from a firm grinding piston rings made of cast iron and was the detritus from the grinder, literally floor sweepings complete with cigarette butts etc. The raw material was sieved to get out most of the muck then put through a similar reduction process in a high temperature muffle furnace to remove the impurities. The trays of powder were placed in a sealed 25 cm steel tube through the centre of the furnace, hydrogen was fed through a small tube at one end and out at the other end, where the remaining hydrogen was burnt. When all the oxygen present in the material had converted to water the colour of the flame changed indicating the process was complete.

The powder was milled and then put through one of those black-magic processes! The manufacturer had made a patent device called a "Rubbing Mill" based on a dough mixer. After milling, the powder was processed in this "Rubbing Mill" which rubbed off all the sharp corners of the particles. As the particles have to be insulated from one another by the binder this reduces the possibility of the corners piercing the binder. It was the most important part of the process. After this, the powder was mixed with Phenol Formaldehyde (a thermo setting resin), dried, milled and pressed in hot dies.

Now we had everything but the "Rubbing Mill" and the owner would not sell it to us. I wound up with the project of designing a "Rubbing Mill" — I was by now working in the design laboratory. It was obvious that the process consisted of rubbing the particles against themselves. The Rubbing Mill designed consisted of a cast iron cylinder with hemispherical ends in which were mounted bearings. Mounted on spindles at each end were propeller like paddles which were driven by chain drives at slow speed in opposite directions. A rectangular box extension on the top was for loading and unloading and was closed with a rectangular plunger with lever and heavy weight applying pressure to the powder.

In operation considerable heat was generated and the cast iron mill was surrounded with a water jacket for cooling. We had Eric Patching working for us, an industrial display artist who was expert in modelling in clay. Between us we designed the patent paddles. One arm of each was propeller-like for circulating the powder and the other arm paddle-like for rotating the powder to achieve the required rubbing action. The device proved completely successful.

(To be concluded.)

*48 Garden Street Blairgowrie Vic 3942

ar

Lord Howe Island — VK9LD (18 Nov-24 Nov 1992)

Bill Horner VK4CRR describes his DXpedition to a Pacific Paradise.*

Way back in March of 1992 I first considered Lord Howe for a week-long operation. When the HIDXA Mellish Reef/Willis Island DXpedition was forced to cancel due to lack of financial support, I again renewed my interest in Lord Howe. With most of the logistics finalised I set out to get accommodation on Lord Howe. With plenty of vacancies available I figured it was just a formality of making the final booking and VK9LD would spend a week of DXing from this beautiful South Pacific island.

Organising accommodation proved to be the biggest problem for the whole operation. In three days, the travel and accommodation arrangements had to be changed three times, and in the end almost became a no-go. At this time Len Holbrok VK4DDK/VK4HV joined me in accommodation negotiations. On past occasions when DXers have gone to Lord Howe, it appears that the locals had some bad experiences with TVI etc, and don't hold amateurs in very high esteem! I must thank Janne Shead of Trader Nick's Lodge for doing everything possible to make our stay most enjoyable, and, more importantly, for agreeing to allow the use of amateur radio. Another major problem when going by small plane to these islands is luggage weight. Oxley Airlines permits 14 kg of luggage per person. With the barest of equipment, Len and I already had 32 kg. Special reservations with the airline were made, and we were permitted 50 kg of luggage.

With my Kenwood TS850S and PS50 etc, a borrowed Cushcraft R7 (VK2BEX-Atsu), my travel arrangements to Brisbane were finalised. My thanks to Kerry VK4MZ for his help in this department, and to Eric VK4NEF for providing me with overnight accommodation as well as my DoTC licence.

Bright and early next morning I met Len at the Brisbane Airport. Len had arrived from the Gold Coast. Before long we had our gear stowed on the plane and were ready for take-off. We left Brisbane on a nine-seater plane at 20.00 UTC and headed for Lord Howe with a 10-minute stopover at Coffs Harbour. Lord Howe is some 300 miles east of the mainland. We arrived on the island at 23.50 UTC, where our host Janne Shead met us. After a quick island tour, Janne took us to our new home for the six days.

Bill Horner VK9LD standing under one of the huge Norfolk Island pines.

It didn't take us long to settle in and instal the equipment. The R7 vertical antenna was erected and mounted on a 4m wooden mast that Len borrowed from Trader Nick's. Soon the equipment was ready and I did a test transmission on all the bands.

The first lucky station to get in the log was VK4SS. Al was sitting on 18 MHz CW waiting for us to start. The propagation was very poor, and we really didn't get anything much into the log before 04.30 UTC on the 18th. That night the pileups continued for hours as the bands stayed open.

The next day Tony Blasl VK9LA arrived to give Len assistance in getting the dipole up. This dipole was home-brewed and perfected by Len. It was trapped for 30/40 and 80m, and proved to be a very successful antenna. Tony (agile as a monkey) ever-so-casually climbed to the top of a huge Norfolk Island pine tree where he mounted one end of the dipole. This antenna was used as a sloper with one end at 10 metres, and the other at 50 -odd metres. We really do thank Tony for his invaluable assistance in achieving the success we had on the low bands.

Over the next couple of days it became very clear that our original

Len Holbrok VK9LD with Norman Hurll VK4HH. Norman got his first licence way back in 1919. Today, at 88 years young, he is still active.

Looking south from the shack of VK9LD.

One of the many beautiful places on Lord Howe Island.

target of 10,000 QSOs was going to be impossible, and that around 4000 QSOs would be more realistic. On the low bands the QRN was for the most part S9 + 20, difficult on SSB, so 80/75m was somewhat a disaster. On 10, 12 and 15m working USA proved almost impossible. On the northern end of the island there is a range of mountains about 300 metres high only 500 metres from the shack. It could have been worse. At the southern end of the island there are two 900m high peaks. These lovely peaks are on the QSL card.

The WARC bands were a little disappointing with limited openings into Europe. Between the hours of 23.30 and 04.30 UTC the propagation was mostly non-existent, and so during this time Len and I found time to do a little exploring. The main transport on Lord Howe is pushbike. Len and I soon found out that we were rather unfit for riding around the island.

Lord Howe is a very laid-back peaceful place with only 400 people permitted at any one time. Some of the main attractions are feeding the fish, snorkeling, swimming, fishing, bushwalking and mountain climbing. Fishing from the shore is permitted in most parts, and deep-sea fishing is available. Snorkeling is very popular, particular at Ned's Beach, and at the quiet coral cays that surround the island. Ned's Beach is strictly controlled; fishing not permitted. Fish feeding is amazing to see or do. I had heard about fish feeding plenty of times, however, never had I imagined seeing fish that were up to two feet long coming and eating out of your hand. The water literally boils with fish when the people start to feed them; the wild ducks endeavour to fight for a feed as well, and to see ducks eating bread and fighting off the fish for more is an incredible sight. One fish at Ned's Beach has been there for years. His name is Albert; he is about a metre long and incredibly beautiful.

Lord Howe Island has two resident hams, Dick Hoffman VK9LH and Tony Blasl VK9LA. Both work seven days a week. Dick and his lovely wife Noelle have their own business called Sea Spray Art and Craft Studio. A visit to this is a must. Noelle has spent many long loving hours painting some of the beautiful sites and wildlife that are found here. To top all that off, they have many exquisite craft-styled items that will catch your eye. Tony works at the golf course, is involved with the National Parks and Wildlife Service and also is caretaker on a farm on Lord Howe. This leaves very little time for radio.

Another tourist and historical area is the Catalina crash site. In 1948, a Catalina seaplane tried to make an emergency landing. Unfortunately it clipped the top of the mountain at the northern end of the island. Today the wreckage is scattered over a wide area of some 800 square metres.

A blocked fuel line caused this disaster which claimed the lives of both crew members.

On 20 November 1992 we had a surprise visitor to our shack. He was given a temporary licence permit way back in 1919. In 1920 he was granted an experimental licence, and in 1923 was allocated the callsign of 2BC. Today, at the very young age of 88 years, this gentleman is still active on the bands. I speak of VK4HH Norman Hurll. His stories were fascinating, and Len and I were honoured to have this pioneer in the shack of VK9LD.

QSO and DXCC breakdown for this operation are as follows:

Band (m)	QSO Total
10	158
12	228
15	1060
17	543
20	1581
30	262
40	824
75/80	140
160	5
SSB Total	2701
CW Total	2100
DXCC Total	110

Some DXCC rare ones worked were: FS, T32, ZL7, VK0, CN FR5, D2, A92, 9J2, JT and VK9N. A QSO with this operation is good for the HIDXA Awards program. The trip home was very scary as we had to fly all the way through electrical storms. The little plane was tossed around like a kite in a 20-knot breeze, and we were all glad to be back on the ground in Australia.

My special thanks to the following for their assistance: VK2BEX, VK4MZ, VK4NEF, VK4DDK, VK9LA, Oxley Airlines, Trader Nick's and HIDXA.

* *26 Iron Street, GYMPIE QLD 4570*

ar

Opening a Packet of Worms

*Lou Destefano VK3AQZ * decided to try Packet Radio, and discovered a few unusual surprises.*

Around Christmas time every year, the family takes its annual holiday by the sea. This year, as I was lying on the beach enjoying the many wonders of nature, such as the well formed sea shells, the thought suddenly struck me that I should try Packet radio.

As it so happens, the local beach kiosk was selling, amongst the ice-creams and hotdogs, EA magazine. A quick flick through the January issue revealed just what I needed — a Packet modem design by Tom Moffat, and more importantly, it cost less than the armful of ice-cream and drinks I had been despatched to purchase by my beach frolicking family.

Thus I delivered all the eats and rushed down to the post office to send away for the kit. About an hour later it arrived (not quite, but it arrived very promptly anyway) and was so easy to assemble that it was ready to go in no time flat. All I had to do was wait for the holiday to be over after which we could head back home where my 386 computer lived. In the meantime, I lay on the beach admiring the lovely seashells, and thinking about all the Packet fun I was about to have!

On arriving home, all the fun started. I loaded up some software, and hooked it all up to the HF rig. I selected the area around 14100 kHz on 20m and tuned around carefully whilst watching the Graphic Packet screen. I tuned and I tuned and I tuned. I tuned for a whole week and nothing happened! The thing must be a dud — no doubt about it! All I got was the sound-track from Blazing Saddles, as Tom had aptly described the sound of the Packet Racket — only something didn't smell right here. No wonder it was cheap, I thought! No — I am doing something wrong. Time to think about it. Then the thought struck me (like it did on the beach). I should do some reading up on Packet; you know — find out what it's all about.

After a bit of reading, the penny suddenly dropped! I had been trying to use a 1200 Baud mode with 300 Baud HF signals. Now in hindsight, next to meteor scatter or moonbounce, HF Packet is the hardest thing to do in ham radio. Having the wrong modem certainly wasn't going to help matters much. Darn — I should have read some of the many articles and columns that are written on the subject. Why bother reading about something when you can have so much fun re-inventing the wheel!!.

I had been trying to use a 1200 baud mode with 300 baud HF signals.

Anyhow, it seemed that in order to make the thing work I needed to find a packet signal on 2m. So I set about looking for the appropriate signals. I am located 60km south of Melbourne at Devon Meadows which is at sea level, and sometimes seems to be in it, for part of the wet season. The number of 2m signals I can hear amount to about 2 a month. You could say I live in the Bermuda triangle of radio reception. I needed some advice so I asked an experienced packeteer at work, where should I look for packet signals.

He kindly gave a me a couple of frequencies and some clues, and away I went. Now it so happens that I had in fact heard some strange signals on the packet frequencies, but I had always thought they were caused by the kid's computer — not packet signals. I connected up the modem, booted the software (which under the circumstance is an apt phrase), and almost instantly the screen burst into life and we were away. Voila! The feeling was one of wonderment. I guess it must have been a similar feeling when the first radio experimenters, at the turn of the century first heard the human voice sent over the ether.

Going from the clacketty clack of the morse buzzer (early packet racket?) to hearing the complex undulations of the human voice, must have filled them with awe. Well the same thing hit me when the screen burst into life with the colourful display of dancing symbols and words. Man had gone from digital morse to voice and back to digital! I remained transfixed to the display for a couple of days and then decided it was time to take the next step — transmit! More fun started. Although the modem could successfully decode VK3RPS, I could not access it. Nor could I access VK3YZW, which was not even decodeable. Anyhow, where was RPS? It was in St. Albans nearly 90 km away and almost at sea level!! No wonder it was strength nothing. What about all the other repeaters — nothing!

Then Derek VK3CL sent out a beacon and with a good strong signal from Cranbourne only about 10 km away. His TNC was beckoning me to call it. So I did — bells rang and the message came back that I had connected! Now this was my first connection — and I was all alone.

A sudden blank feeling came over me. What do I do now? What do I say? I guess all packet operators must experience this feeling the first time they connect. Your mind just goes blank. I know — I will type "hello". The VK3CL unit was in fact in auto mode and Derek was not at the wheel. "Hello" is not a valid command, it replied. Type "help" or something.

Ah, now we were cooking!

After that success, and with some patient help from Derek, we started to figure out the basics. I still could not work VK3RPS, although I could digipeat via VK3CL. Not the same thing. I needed to do it for myself. I commenced by trying to improve the received signal. I carefully checked the alignment of my old rig which was a homebrew synthesized unit, but was unable to gain much. Then I added a GaAsfet preamp out of Silicon Chip by Garry Cratt using a 3SK121. A little tweak and bang! The signal from RPS shot up out of the noise up to strength 5 — great! Now

for the transmitter which was putting out 8 watts but should have been doing 25 watts or more (2N5591). A long time ago it had dropped in power and I thought the chip was gone. Might as well try and fix it. So I opened it up, prodded around the area of a rather dull solder joint and bang again — 30 watts!

I could now connect directly to RPS. I answered all its questions (Derek had clued me in) and we now had a home BBS — 90km away! At this stage I could hear VK3YZW in Caulfield but could not really work it properly. Now it was time to tackle the antenna which was a Dick Smith Slim Jim bent at 45 degrees courtesy of a January wind storm. A beam was needed and so I assembled a 5 element vertical yagi and fixed it to the chimney. Yep both VK3RPS and VK3YZW came up 3 or so S points but I could still not work VK3YZW reliably.

I then put together a 45 watt amplifier using a 2N6084. A little better, but still not enough, and no gain on receive. I had a 10 element beam at mum's place — that would do it. I had a Hills telemast with a HF triband junior type beam on it. It was only at 15 feet. I had put it up higher in the past but the wind kept breaking it. I had become sick of replacing the top section every time the wind exceeded 10km/h. So I left the top section mostly inside the middle section which was mostly inside the lower section — hence it was only 15 feet high. This was not exactly the right set-up for bursting up the pack in a DX pile up, nor was it much good for taking an additional 10 element 2m beam. It was time for a big step — yes — the Nally tower! I guess all hams dream of owning a wind up, winch down Nally tower sometime in their life — a bit like owning a Ferrari.

So out with the "Trading Post" (1), and soon we were driving to some obscure country town with a 3 metre long trailer expecting to bring home two 8 metre lengths of lattice tower. Well, eventually we found the town and the house. The "house", had been described over the phone as the only new brick house in town — can't

WIA News

Spectrum Management Agency Startup

From 1st July, the management of the radiofrequency spectrum in Australia will be the responsibility of the Spectrum Management Agency (SMA), headquartered in the Benjamin Offices in the Canberra, ACT, suburb of Belconnen.

The SMA takes over roles previously the province of the Department of Transport and Communications, and will be responsible for the planning, operational and regulatory functions "... required for the effective management of the radiofrequency spectrum."

Established as a separate Commonwealth agency within the Federal cabinet's Transport and Communications portfolio (held by Senator Bob Collins), the SMA's responsibilities include preparation of a spectrum plan and frequency band plans, licensing, pricing and regulation of spectrum usage.

miss it. Well, I did miss it! I misheard -it should have been "the only timber house next to a Nubrick house"! Anyhow, after following the owner for 20 miles down a tractor track, we finally had the tower loaded and ready to head back. It was in fair condition, with only the top section having been used to hold up a rather awesome looking country TV antenna. A few extra pieces had been welded on, but otherwise it was okay and not too expensive. Anyway, having come all this way, I wasn't going home empty handed irrespective of whether it was good, bad or indifferent. So we all waved goodbye, good luck, and so on, and away we went.

The next town homewards was about 10km away. As we approached it I noticed, as I came over a hill, a police car at the bottom, in a side street at the edge of the town. Although the trailer was registered, etc, I was already pretty nervous about the extra length and this was certainly not going to help. Someone must have tipped them off. Maybe that's how they raise revenue — sell people towers, nab them on the way out, slap 'em in jail, and you're never seen again! No, couldn't be that. Anyhow, I had a large pair of knickers tied to the end which you could see for miles (yes they were mine!). So I continued down the hill very slowly so as not to stir things up. He held up the radar gun, but I guess at 1 km/hour I did not have a speed problem. And so I passed him without being stopped. I guess in the country they are used to people carrying long loads on trailers. Would you believe it, after surviving this, 10km further along the road, we came across the next town and the same thing again. A man sitting in a police car waiting for me — only this time he followed me after I passed him. Around the corner we went and bingo! We had become part of the town parade (probably a Potato festival or similar) travelling down the main street of Hicksville with an 8m tower at the rear for good measure. I yelled out of the car window that I was delivering it to the showgrounds for the firemens' exhibition, and fortunately they let me go past and outwards I went!

We arrived home 8 hours later, somewhat frazzled but okay. It sure was a nerve racking experience. If I had known what I was in for, before buying a second hand tower, I would have paid the extra, and let the experts do it. Anyway, 4 weeks later and the "little" you beaut, 2 section, 15 metre tower was up and loaded with the HF beam. This now left the Hills mast free for the 10 element, 2m beam and thus able to go higher (with some nylon guy ropes). So finally after all this, up went the beam and we were now able to work VK3RPS quite well, and VK3YZW some of the time.

After the frustrating episode of trying to make the 1200 baud modem work on HF, I decided to build one which would. To this end I built a modem using a 7910 world chip which I can say is working quite well. (Watch for a description of this in a future issue.)

It's been 6 months since that fateful day on the beach and I can honestly say that the whole thing has been a barrel of fun. I have put up a new tower, resuscitated my old rig, loaded lots of strange software, with equally strange names (Yapp!!), and become a "packet pest" at work. Sometimes I reflect back — and wonder what made me do it!

The moral of this story is that you had better watch out for the packet bug. If it bites you, you could end up like me!

Reference (1). The "Trading Post" is a weekly newspaper devoted entirely to advertising used goods and equipment. It circulates throughout Melbourne, and most Victorian provincial centres.

* *7 Worthing Road, Devon Meadows VIC 3977*

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of May 1993.

L20941 MR A G EDGE
L30549 MR S DODDS
L30850 MR R CARRASCO
L40349 MR R C DENHAM
L50301 MR Y T HUI
VK1FF MR J A MULLER
VK1NAP MR W J MCINTYRE
VK1NB MR N L BRAMWELL
VK2BOD MR M CARDOSO
VK2BSL MR B SAAVEDRA
VK2CBD MR B J DAWSON
VK2GXW MR J AMORIM
VK2JPR MR G F ENGLISH
VK2SMG MR M R GREEN
VK2STU MR S LAMB
VK2SUN MS S M BURKITT
VK2TCJ MR Y A SONG
VK2XVW MR N C FARLEY
VK2XXD MR P A RIGG
VK2YCS MR S S CLARK
VK3CBE MR B EVERETT
VK3CL MR D CLEGG
VK3EXW MR G CUMMING
VK3MGG MR G LAGOS
VK3MHX MR W HOLMES
VK3MRS MR R SMITH
VK3OT MR S R GREGORY
VK3TAS MR S BASZAK
VK3VAC MR A APRILE
VK4BM MR H F EDWARDS
VK4DGQ OLD DIGITAL CLUB INC.
VK4KGO MR B R KNOWLES
VK4LGC MR G R COUTTS
VK4LY MR S J BLOXHAM
VK4TJB MR J R BRIGHT
VK4WIP IPSWICH & DIST RADIO CLUB
VK5AAM MR A A MARKS
VK5AI DR J F CASHEN
VK5AKJ MR R K JOHNSON
VK6BDP MR W M JOHNSON
VK6KCC MR A G GENOVESE
VK6YFI MR S G WILLIAMS
VK8FT MR F TURNHAM

Have you advised DoTC of your new address

WIA News

Amateur Radio Publicity Dispels the Myths

A story on page 15 of the Sydney Morning Herald for Saturday May 15th should go a long way towards correcting public perceptions of radio amateurs as cranks who listen to crackly transmissions on shortwave between bouts of eavesdropping with scanners on salacious royal telephone calls.

The article explains how John Simon VK2XGJ was awaiting news of the launch of the latest (ill-fated) packet radio satellite, Arsene.

Written by Herald staff journalist, Richard Macey, the article was accompanied by a picture of John in his shack. A keyboard and computer monitor are in prominent view among the transceivers, but there's not a microphone in sight!

Macey clearly explained packet radio in laymen's terms, after telling readers that "amateur radio enthusiasts have come a long way since the days of huddling over crackling wirelesses...".

"Arsene....will serve the growing band of hobbyists who specialise in "data transfer'. Instead of speaking into microphones, they use radios to enable their home computers to speak to computers in other parts of the world.

"Mr Simon said that to use the relay in the sky, people needed two radios and two aerials — one set to receive messages and one to send, a computer, a device to link the computer to the radio and an amateur radio licence," Richard Macey wrote.

Remember to leave a three second break between overs when using a repeater.

AMSAT Australia

*Bill Magnusson VK3JT**

ARSENE

The new French amateur radio satellite ARSENE was successfully launched from Kourou French Guiana on Wed 12 May 1993. It has been inserted into its final high altitude elliptical orbit. Regular Keps are now being distributed as part of the NASA 2 liners on the packet radio networks. Unfortunately something seems to be amiss with the 2 metre down-link. The telemetry indicates that the transmitter is on and working so the implication is that either it has a problem with the connection to the antenna or it is way off frequency. Amateurs everywhere have been asked to look for a signal from its (maybe free-running) oscillator somewhere in or around the 2 metre band as the crystal may have been damaged during launch. The signal should be telemetry at a rather slow baud rate. According to Bernard F6BVP its basic data is 2048 Hz Manchester encoded PSK at 128 baud. Please report any such signal ASAP to Bernard F6BVP@F6BVP.FRPA.FRA.EU or to AMSAT-VK.

The mode "S" transponder was opened for users on Tuesday 01 June 1993 but so far I've heard no reports of contacts made or signals heard. The mode "S" transponder frequencies are, up-link 435.1 MHz +/– 8 kHz, down-link 2446.54 Mhz +/– 8 kHz. The mode "S" beacon is on 2446.47. MHz.

More on Acronyms

Further to the "HERCULES" acronym in the May column, this one's even harder to believe. Looking through a summary of acronyms recently I came across the following, "TLA = Three Letter Acronym".... No further comment!

Clockwork

If you are running an auto-track system where exact timing is important or you just like things to work properly, you are very likely dissatisfied with the accuracy of your computer clock. Some aren't all that bad but many are woeful. You could go to the expense of a super accurate clock chip but there are simple, cheap alternatives. "CLOCKWORK" is one of a number of similar share-ware programs available on BBSs or around the traps. It's only shortcoming is that the documentation is all but incomprehensible. Pity, because it's quite simple to get going and very effective. It will keep your system clock accurate within 1 or 2 seconds all the time. If you have problems with it, I have a "simple" set of instructions to get it up and running. Send me a 360 floppy if you want a copy. If there's enough interest I'll publish it in the column.

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000z, or 0900z on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.

AMSAT Australia newsletter and software service:
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Up-Dating Keps

I get quite a few queries regarding the procedure for up-dating Keplerian elements in various satellite tracking programs. Here are a few basic tips. Kep element sets are published in a number of ways:

1. In printed form in various publications.

No problems as you are compelled to type them into your program and you just need to be careful, specially with the "NASA 2 liners', although they can be decoded with care. AMSAT format is much better for those who type in the Keps.

2. In electronic form on packet BBSs and phone BBSs.

They appear in two formats, NASA 2 LINE and AMSAT format. Most computer programs require that the NASA format Keps be "stripped" of ALL extraneous headers, footers etc. and be presented to the program as a block of data, containing the data and NOTHING else. You can do this operation using your favourite screen editor.

AMSAT format Keps have two advantages. They are human readable and they can be loaded into most programs that support auto-update without stripping anything off the file. Disadvantages. They usually appear on the BBSs as more than one file and have to be down-loaded separately and it is VERY important that they are actually in real AMSAT format. Some files have appeared recently with different order and different terms to define the elements. Most programs will reject these. For the above reasons it's probably best to stick with the NASA format Keps.

3. Satellite names.

Be very careful that the Keps you are loading in use the same titling protocol as the satellites already in your file. As an example you may have elements in your program for a satellite called "arsene'. If you load in a new set for a satellite called "ARSENE" (in CAPITAL letters) your program will assume this is a different satellite and make a new entry. The only problem is that it may not be immediately apparent as the new entry will be placed in the first available space in the data bank and will very likely be satellite number 215 or something on the second or third page and you may never notice it. You'll be left wondering why the program didn't up-date the original satellite. It's a very good reason to stick to the one source of element data.

There's a nice piece of soft-ware around the traps called IT SORT. It allows Instantrack users to manipulate the satellite file to add, delete or move around the entries in your satellite data base. This feature is something that was sadly lacking in the original program. I'll review this software next month.

New MIR Crew

On July 1st 1993 the current crew, Aleksandr Poleschuk R2MIR and Genardy Manakov U9MIR will be joined by Vasily Zibliev R2MIR and Aleksandr Serebrov R4MIR. The current crew will depart for Earth on 22nd July 1993. They have been quite active both on packet and voice and have regularly made contact with school groups in a number of countries. I understand the new crew members are similarly interested in contacts with young people of school age and that at least one of them is engaged in educational activities at "Star City". It is very unusual for such a long period to elapse with both crews on board.

* *359 Williamstown Rd Yarraville VIC 3013*
Packet: VK3JT@VK3BBS

ar

How's DX?

*Stephen Pall VK2PS**

With the changing seasons, propagation is changing also. I think we all agree, that propagation was not particularly good in May. As a matter of fact, there were a number of days when it was almost impossible to have a contact with the USA or Europe. The 20m band — the favourite of DXers — was dead on several days. Solar activity has been low around the 100 mark during the day. One should remember that the bottom of a solar cycle is usually reached when the solar flux number is in the vicinity of 60.

The May propagation pattern was just a taste how in the next few years the bands will behave. Open one day and completely closed the next. Greyline openings, sunrise and sunset times, the low bands and proper low band antennas will be the favourites of the DXers in the coming years.

Mellish Reef — VK9M

The Mellish Reef DXpedition is now in the preparation stage (see AR May '93 p36). Bill VK4CRR advises that the expedition will leave Bundaberg, Queensland, on 15 September on a bigger yacht. The "Nina Q-1" is a 63ft (19m) twin-masted schooner; it is faster and can accommodate eight operators and the three tons of equipment. The expeditioners will be at sea for about three and a half days and plan to start operations on 19 September. Atsu VK2BEX has also decided to join the group as an operator. Latest news is that due to shifting sands on the reef the dry patch is now about 250 feet long and about 120 feet wide (approx 77x37 metres), not much space for five stations, antennas, eight operators, tents, generators and all other equipment that is needed for such an undertaking. One only hopes the dry land will grow a little bigger in the coming months. Donations are still very much welcome and should be sent to VK4CRR Bill Horner, 26 Iron St, Gympie, Old 4570, who is also the QSL manager for the group.

Spratly Islands — 1S

After many months of planning and rumours of impending start of activity, the expedition became a reality on 27 May. Three Finnish operators, among them Martti OH2BH, three US, one Japanese, one from Singapore and two from Malaysia made up the team which was active for six days on all bands and modes, especially during the WPX CW contest. Frequent identification of the station, together with the QSL information, was welcomed by the big "dogpiles" who tried to contact the station using the callsign 9M0S. QSL to W4FRU (see AR April '93).

Eritrea — E35X

In the referendum held on 24-26 April, 99 per cent of the Eritrean population voted in favour of independence from Ethiopia. The formal declaration of independence was made on 24 May. It is expected that the DXAC and DXXC will accept operations from Eritrea in the near future either as a new country or as a reinstated one.

A Norwegian group of amateurs, LA6VM, LA9DL, LA7XX, LA1EE and JF1IST, was active from 31 May to 9 June 1993. Besides operating, the amateur group also held seminars on amateur radio, attended by engineers, technicians and students selected by the Telecommunication Authority of Eritrea.

It is planned to establish a club station with equipment donated to the former Bouvet Island expedition and with assistance from various US DX foundations. QSL to LA6ZH Ruth Tollefsen, PO Box 17, N-0617, Oslo, Norway.

It is rumoured that JH1AJT and EJ9ZB will return shortly to Eritrea for a second operation. In the past few years the following activities were heard from Eritrea: 9ER1TA and 9ER1TB (1992) 9F2CW/A and 9E2A 1993).

Transcontinental Balloon Attempt

By the time you read this, the transcontinental balloon attempt by Dick Smith, adventurer, publisher and radio amateur VK2DIK has been either completed or abandoned. At the time of writing this, his opponent, Phil, had a successful lift-off in a bigger helium balloon and is travelling in a north-easterly direction. Dick one night earlier had aborted start. When filling his smaller balloon with helium the sudden wind change twisted the envelope of the balloon, and to stabilise it and prevent a major damage, it was necessary to let the helium escape. Later, repairs to the envelope, and unfavourable wind conditions, had put the attempt back by at least four days. Dick eventually will lift off from Carnarvon, Western Australia, and hopes to land on the east coast of Australia. The New South Wales Division of the Wireless Institute of Australia (VK2) has been asked by Dick to assist with amateur radio communications, and yours truly had the task or organising the team of volunteer operators for a continuous 24-hour duty. Dick's former firm lent a FT1000 and an FT990 for the operation, whilst Dick took his trusty FT757 and a vertical wire dipole with him into the plastic gondola hanging under the balloon. A variety of frequencies was used to keep watch and to assist if necessary, which activity did not permit QSOs of the ordinary kind with the rest of the amateur fraternity. It was planned at a later stage of development, depending on a variety of circumstances, that a special event station may be activated with the callsign VI2AUS to celebrate the attempt. QSLs with SASE and/or return postage to be sent to the QSL Manager, VK2WI.

(Stop Press: Dick landed successfully near Casino on 18 June. Ed.)

East Bremmer Island — VK8TI

The planned Truant Island expedition had to change course due to a cyclone which came across the Gulf of Carpentaria from the direction of Papua-New Guinea. Four and a half metre waves tossed the 15m (50ft) fishing boat at will, like a small cork on the water. The wind was blowing at 30 knots. Plans were changed and the group landed on East

Bremmer Island. To operate there officially, they had to obtain separate permission from the traditional Aboriginal land owners. An official government approval was given earlier. Landing on the island was difficult as there is no harbour, and they had to run the boat up on the beach in the surf. Two of the group landed with all the equipment on the first day; the three others came ashore three days later. The boat was standing by 200 metres off-shore. Despite equipment failure, the group (see AR May 1993) under the leadership of Mal VK8LC (now VK6LC) had a successful operation — about 2000 contacts were made, mainly on 15 metres — including a few hours operation on the VK novice band, but the 20m band was also activated. Harry VK8CR will outline the adventures and tribulations of the group in a future longer article in AR, on an island where there were only five amateurs, no other humans, but quite a few crocodiles. The activity was officially registered with the IOTA Program (OC-185) and the island is located at 136 deg 52' East longitude and 12 deg 05' South latitude. QSL goes to PO Box VK8TI, Gove, NT 0881, Australia.

Future DX Activity

- Didier FD1NZO, Jean Michel F1ODK and Pascal FD1RZJ will be active from Lichtenstein HBO/.... on 80, 40, 20, 15 and 10 metre bands from 17 July for seven days. QSL to FD1RZJ Pascal Sotty, Grand Champ, 71130 Chassy, France.
- 9Q5RM is active in Zaire. QSL to Richard McDonald, Box 42, Cyangugu, Rwanda, Africa.
- 9G1SB was heard on 21335kHz at 1545 UTC in the USA. QSL to Sewell T Brewer, Box M144, Accra, Ghana.
- John PA3CXC can be heard from time to time from South Sudan as ST0/PA3CXC. QSL to home call after his return to Netherlands.
- There will be a DXpedition to the Andaman (VU4) and Laccadive (VU7) islands sometime in October.
- Rumour has it that a "small speck of sand" island in the Pacific will be activated in the distant future.
- Cameron TJ1JD is active. QSL to F1MOW.
- Ascension Island will be activated by N6TJ who will sign ZD8X during June/July.
- It was reported early in May that the planned expedition by the VK6 group to the Houtman Abrolhos Island Group was abandoned at a short distance from the island.
- YW5LT will be active 15-18 July from Los Testigos Island (SA-059). QSL to W1AF.
- Eddie VK2KS plans to operate soon from Vietnam as XV2A or as 3W1C.
- A group of eight US amateurs will visit St Pierre and Miquelon Islands from 9-13 July, for the IARU contest. QSL to NU8Z.

Interesting QSOs and QSL Information

- T71CE-Francis-14195-SSB-0546-May. QSL to F6FQK Francis Kremer, 31 Rue Louis Pasteur, F-67490, Detwiller, France.
- ZA1JZ-14031-CW-0216-May. QSL to I2MQP Pietro Mario Ambrosi, Via A Stradella 13, I-20129, Milano, Italy.
- EA9PB-Frank-14228-SSB-0556-May. QSL to the Manager, Box 2190, Ceuta, Spain.
- TI4CF-Carlos-3799-SSB-1048-May. QSL to TI2CF Carlos M Fonseca Q, Box 4300, San Jose 1000, Costa Rica.
- J49GI-14190-SSB-0531-May. QSL to SV1AFN Makis Katsouris, Artakis 127, GR-17124, Nea Smirni, Greece.
- JW1CIA-Egil-14214-SSB-1135-May. QSL to LA1CIA Egil Hansen, Svenskeberget 60, N-1670, Kraakeroy, Norway.
- 3C1TR-Ed-1422B-SSB-0618-May. QSL to K8JP Joseph L Pontek Sr, PO Box 80262, Indianapolis, IN 46280, USA.
- T94CR-Mirza-14251-SSB-0510-May. QSL to SM5AQD Hakan Eriksson, Svanv 6, S-61162, Nykoping, Sweden.
- T93M-Dan-14196-SSB-0413-May. QSL to DL8OBC Felix Riess, Postfach 1253, D-3007, Gehrden 1, Germany.
- VQ9MW-Brad-21205-SSB-0516-May. QSL to KD4RDQ Carey B Hammon, 805 Woodsdale Ter, Macon, GA 31210, USA.
- TR8JH-Jean Michelle-14250-SSB-0550-May. QSL to W3HCW Carl F McDaniel, 2116 Reed St, Williamsport, PA 17701, USA.

From Here and There and Everywhere

- 17 May was "International Communication Day", better known as ITU Day. The International Telecommunication Union regulates the electromagnetic spectrum and, among others, the amateur radio frequency band allocations. The forerunner of the ITU was the International Telegraph Convention which was founded in Paris in 1865. In 1947 the ITU became a specialised agency of the United Nations with headquarters in Geneva, Switzerland. The VK2 Division of the WIA operated the special event station AX2ITU for 24 hours on that day. QSL with SASE to VK2WI.
- When sending reply envelopes to European stations and/or QSL managers in Europe, try to send the standard 115mm x 163mm European size (shades of United Europe!). In some European countries the postage will cost more if the envelope size is smaller. Strange, but true.
- The correct prefix for Yemen is now 4W instead of the 70 which was used before.
- San Marino, the tiny land-locked republic on the Italian mainland, was accepted into the Council of Europe. This gave the occasion for the special event station T71CE to be on the air from 6-10 May.
- As from 1 May there is a new prefix for Bosnia-Hercegovina. T90xxx for the National Soviet and visitors, T91xxx clubs, T94xxx (old 4N4 callsigns), T95xxx C-class operators, novices on all bands.
- The FR/G/DJ6SI operation from Glorioso Island is still not acceptable for DXCC credit; further documentation is needed.
- The address of the Ukrainian National UARL QSL Bureau is PO Box 56, 2520001, Kiev, Ukraine.
- The "famous" Box 88 QSL Bureau in Moscow is still working, but on the "user pay" principle. Have you noticed that the avalanche of Russian and other CIS SWL cards has stopped?
- According to the OPDX/BARF 80 DX News Bulletin, the only legal active stations in Western Sahara (S0) are as follows: S0RASD Club Station, S01A (op Naama Zeine Edinne), S01B (op Azman Mohammad) and S01MZ (op Manfud Zein).
- Look out for a new Tuvalu local operator; Juan T20JC has been heard on 14247. QSL Manager is KL7H.
- If you worked VR8B on CW on 14MHz, do not QSL. "Yvonne" was a pirate and had very strong signals on the east coast of Australia.
- Jack T30JH is very active on 18MHz. He worked 47 prefixes on SSB in four days. He is also planning to be active on 30 metres SSB in the future.
- A special event station was activated on Peru's highest mountain with the callsign 4T7HP on 24 June. QSL to OA4WM and/or OA4ED.
- What do they know, what we do not know? BT2000BJ was a special Olympic station working the US on 23 May, and gave its QSL manager as BY1QH, which is the amateur radio station of the Tsiunga University of China in Beijing.
- Marion Island Z28MI is active and was heard working VKs on the ANZA,

21205kHz net. The operator is Christie, and the home call is ZS1CDK.

- Warwick VK4AP, who operated for a few days from Canton Island as T31AP in August 1992 (see AR Oct '92) sent me a belated QSL card and a few notes. His short trip was not a DXpedition, it involved an engineering project and the radio just happened to be along for the ride. Warwick is not a DXer, but was happy to assist a few needing Canton Island. "Sorry the card is late," says Warwick, "but I have been away a lot."
- According to a news item in Sydney's "Daily Telegraph Mirror quoting a London source, bags full of letters sent to Russia from abroad at the end of April or beginning of May have been dumped in a lake near Moscow's international airport. Was your QSL card with IRCs or green stamp among those letters?
- Various sources, including a Russian newspaper, reported the new callsign structure for the CIS (formerly Soviet Union) republics. Some of these callsigns have already appeared on air, others still use the old prefixes and there is no indication when all these changes will be implemented. Here is the information, for what is worth: Armenia = EK, Azerbaydzan = 4J; Belarus = EU, EV, EW; Georgia = 4L; Kazakstan = UN, UO, UP, UQ; Kygystan = EX,; Moldova = ER; Russia = UA to UI, 4K; Tadzhikistan EY; Turkmeniya = EZ; Ukraine = UR to UZ, EM to EO; and Uzbekistan = (not yet confirmed) UT to UM.
- 4U1VIC — the Vienna International Amateur Radio Club callsign, will be activated by WB4FNH from 13 June to 28 July. QSL to home call.
- Steve Salmon AA6LF has sold his house and bought a yacht in which he proposes to sail around the world during the next seven years. He wants to visit 46 DX countries and islands starting with Mexico in November 1993, and finishing on Galapagos Island in April 2000.
- Phil FD1DHW has returned to France after a successful stay in Djibuti. He operated as J28BS and made about 2400 CW contacts, with an additional 100 SSB QSOs.
- The Canadian special call XO7G was celebrating the 1993 Friendship games until 30 June. QSL to FARs Victoria, c/o Camosun College, Box 128, 3100 Foul Bay Road, Victoria, BC, V8P 5J2 Canada.

QSLs Received

5R8DG (7W MGR F6FNU) — TZ6NU (7W MGR F6FNU) — T31AP (6M OP VK4AP) — J28BS (8W OP FD1DHW) — S59KAB (4W OP) — S21B (3M MGR 2RFRU) — S21ZG (3M MGR W4FRU) — ZK3RW (10D OP ZL1AMO) — A22EX (2W MGR N4CID).

Thank You

Thanks to all of you who kept me informed and assisted me in compiling these notes, especially: VK2AFE, VK2DID, VK2DIK, VK2KFU, VK3TL, VK3YXK, VK4AP, VK4CPA, VK4CRR, VK4DA, VK6LC, FD1NZO, J28BS, HL9HH, T30JH; and the following publications: QRZ DX, The DX Bulletin and the DX News Sheet.

Good DX and 73

* *PO Box 93 DURAL NSW 2158*

ar

WIA News

Standards Action

Four committees to prepare standards on radiocommunications equipment are being established by the national standards body, Standards Australia, under new arrangements with the Department of Transport and Communications.

General radiocommunications equipment standards will be looked at by the committee dubbed RC/1; RC/2 will look at standards in the field of satellite and telecommunications networks, RC/3 will cover low power radiocommunications equipment, and RC/4 will cover maritime and safety of life equipment.

The committees will be making recommendations on the legislative application of the standards they prepare, according to a report in the May Newsletter of the Australian Electrical and Electronic Manufacturers' Association (AEEMA).

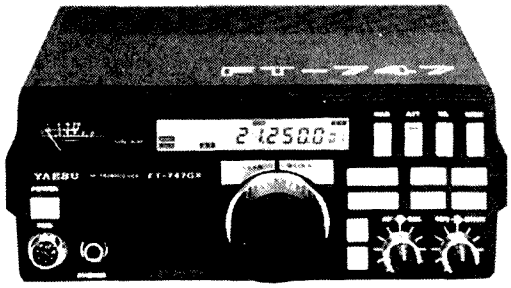
Meanwhile, the standards authority for Europe — the European Electrotechnical Commission (EEC) — has set a date of 1st January 1996 for stringent new maximum emission requirements to apply to electromagnetic interference (EMI) from electrical and electronic products manufactured or sold in Europe.

Here, Standards Australia had made no decision as of June on the question of EMI requirements for such products and the Federal government's Department of Industry Technology and Regional Development (DITRD) "...has yet to formulate a position," according to AEEMA's Newsletter for June.

"There is a risk that if the matter is allowed to 'drift', an unreasonable timetable for compliance with requirements similar to that imposed by the EEC might be introduced if Australia adopts the same introduction date.

"Alternatively, if Australia is out of step with the EEC process the Australian market could become the 'dumping ground' for products that no longer comply with the European requirements," says AEEMA's Newsletter item.

AEEMA's Board believes that Australia should adopt the same date for EMI compliance for electrical and electronic products manufactured or sold here — that is, 1st January 1996. They are to take up the matter with DITRD and other relevant government departments.



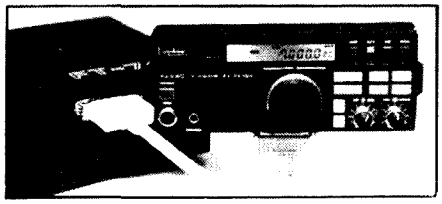
WITH ANTENNA BONUS!

Your choice of 2 'Mobile One' mobile HF antennas from our range of 80m, 40m,or 20m whips. Worth Over **$90**

2 Year Warranty
FT-747GX Compact H.F Transceiver

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts PEP output on all 1.8-30MHz amateur bands, and general-coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and an easy-to-read backlit digital display, dual operator-selectable tuning steps for each mode,dual VFO's for split-frequency operation , and 20 memory channels (eighteen of which can store split Tx/Rx frequencies). Wideband 6kHz AM and narrow 500Hz CW IF filters are also a standard feature. Complete with Yaesu MH-1 hand microphone.
Cat D-2930

$1299



RMK-747 Remote Mounting Kit

This modification kits allows the front panel of the FT- 747GX to be mounted away front the body of the transceiver. Price includes installation on your FT- 747GX.
Cat D-2931

$349

SAVE $100

EXCESS STOCK CLEARANCE! -BELOW COST!

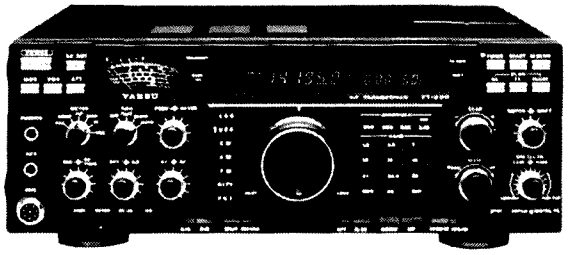
Great for 10M FM repeater operation!

UNBEATABLE VALUE

$1695

2 Year Warranty
FT-650 6m, 10m, 12m 100W Transceiver

Now's the time to get ready for the summer DX season on the 6m and 10m bands, and the Yaesu FT-650 mobile transceiver allows you to do it in style. Its all-mode operation, 100W RF output (SSB, FM, CW), and continuous 24.5 to 56MHz receiver coverage allows you to hear signals outside the Amateur bands, so you can track the rising M.U.F and work stations as soon as the band opens. The use of 3 D.D.S's and a 2-stage low noise RF pre-amp results in a very quiet and sensitive receiver (SSB/CW, 0.125uV) so you'll hear weak signals much more easily. To cater for the FM enthusiast, the FT-650 provides repeater offsets, an FM narrow mode as well as exceptional 0.16uV (12dB SINBAD) sensitivity. Other features include selectable tuning steps, manual/auto IF notch filter, RF speech processor, IF shift control, 105 scannable memories and an effective noise blanker. Includes MH-1 hand microphone.
Cat D-3250



FT-990 DC Version

(Requires 13.8V)
Cat D-3255

SAVE $200

Only $2995

2 Year Warranty
FT-990 H.F All-Mode Base Transceiver

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW,FM), with high duty cycle transmission allowed.
An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 90 memories and one-touch band selection. Microphone optional extra.

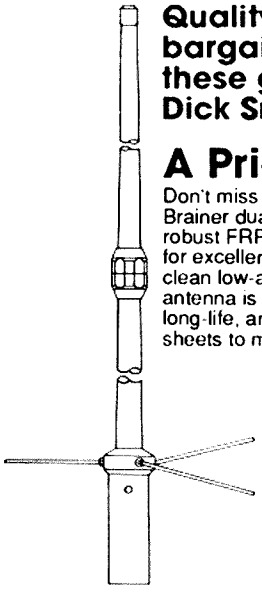
B1463

Pick Up More With These BRAINER Bargains!

Quality Japanese antennas at a bargain price. Don't miss out on these great specials, exclusive to Dick Smith Electronics!

A Price Breakthrough!

Don't miss our best ever prices on these high performance Brainer dualband 2m/70cm base station antennas. They use robust FRP (fibreglass reinforced polyester) tubing construction for excellent all-weather operation, and a ground-plane for a clean low-angle radiation pattern which maximises gain. Each antenna is rated at 200W, uses stainless steel hardware for long-life, and comes with detailed locally-written instruction sheets to make construction easy.



Compact GST-1 2m/70cm Antenna

Frequency	144-148MHz, 430-450MHz
Gain	6dB on 2m, 8dB on 70cm
Length	2.5m
Type	2 x 5/8 wave (2m) 4 x 5/8 wave (70cm)

Cat D-4830

$179 **SAVE $20**

BRAINER

Long Range GST-3 2m/70cm Antenna

Frequency	144-148MHz, 430-440MHz
Gain	7.9dB on 2m, 11.7dB on 70cm
Length	4.4m
Type	3 x 5/8 wave (2m) 7 x 5/8 wave (70cm)

Cat D-4835 **$269** **SAVE $10**

2m/70cm Magnetic Mobile

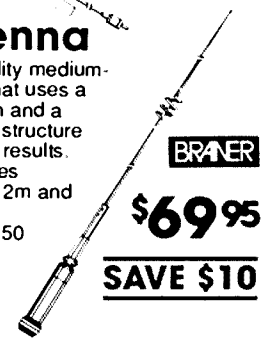
The black TM-723M is a slimline, compact dualband mobile antenna that's supplied with a low-profile magnetic mount and low-loss coax cable making it ideal for city drivers who can't use a long antenna. While only 0.7m high, it provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a conservative maximum power rating of 50W.
Cat D-4812

BRAINER

$69.95 **SAVE $20**

2m/70cm Mobile Antenna

The ST-7500 is a high-quality medium-sized dual-band antenna that uses a ground-independent design and a tiltable stainless steel whip structure to provide excellent mobile results. It's just 1m long, yet provides approximately 3dB gain on 2m and 5.5dB gain on 70cm with a maximum power rating of 150 watts. Requires an SO-239 antenna base or SO-239 magnetic base.
Cat D-4810



BRAINER

$69.95 **SAVE $10**

2m/70cm Hi-Gain Mobile

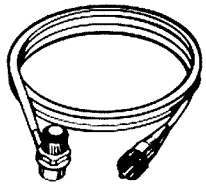
The ST-7800 is our best long-range, dualband mobile antenna, providing high gain (4.5dB on 2m and 7.2dB on 70cm), while only 1.5m in length. It incorporates an inbuilt tilt-over mechanism and has a maximum power rating of 150 watts. The ground-independent design also allows the use of gutter or boot/bonnet brackets for easier mounting. Requires an SO-239 antenna base.
Cat D-4815

BRAINER

$119.95 **SAVE $10**

SO-239 Base/Lead Set

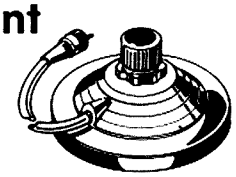
A convenient way to mount a PL-259 type antenna. This quality Japanese SO-239 base is pre-wired with 4m of low loss coax cable and has a PL-259 already fitted for connection to your transceiver.
Cat D-4052



$24.95 **SAVE $5**

SO-239 Magnetic Antenna Mount

A powerful Japanese magnetic mount for use with PL-259 antennas. It's supplied with 4m of quality coax cable and fitted PL-259 plug. Suits small to medium VHF/UHF antennas such as the ST-7500.
Cat D-4520



$59.95

PHONE & MAIL ORDER SERVICE & YAESU BROCHURE HOTLINE
Outside Sydney (Free Call) 008 22 6610 Sydney & Enquiries - (02) 888 2105
Fax: (02) 805 1986 or write to Dick Smith Electronics, Mail Orders, Reply Paid 160 PO Box 321 NORTH RYDE NSW 2113
Yaesu stocks not held at all stores, please contact your local store for stock availability, or order by phone 008 22 6610

DICK SMITH ELECTRONICS

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 8622 • Kotara 56 2092 • Liverpool 600 9888 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney (Greenwood Plaza) 964 9467 • Orange 618 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 ACT• Belconnen (06) 253 1785 • Fyshwick 280 4944 VIC • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 326 6088 & 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0522 QLD • Booval 282 6200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 6255 • Maroochydore 791 800 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 SA• Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6088 • St Marys 277 8977 WA • Cannington 451 8666 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 TAS • Hobart 31 0800 • Launceston 344 555 NT • Darwin 81 1977

A Packet of Packet

Warren Toomey VK1XWT *

As you can see by the change in callsign above, Kevin Olds VK1OK has passed the packet column to me; he has taken over the WIA Federal Presidency after the sad loss of Ron Henderson VK1RH.

Therefore, this month's column is a fill-in until I can get my act together. This column is intended to present ideas and topics sent in by the packet community, so if you have an idea for a column, or indeed a whole column, please send it in to me at my QTHR or to the addresses below. I'm also happy to field questions about the topics in the column.

Warren VK1XWT
VK1XWT@VK1KCM.ACT.AUS.OC
vk1xwt@minnie.vk1xwt.ampr.org

This month's topic is, what is a network, and what makes it so?

What's a Network?

People often talk about the "Amateur Packet Network", but do they mean AX.25, NETROM, ROSE, TCP/IP, the BBSs, or a combination of these? In this column I want to describe what a network is, and show in what ways our packet systems fit the description.

Loosely speaking, a network is a collection of computers that can exchange data directly or indirectly via one or more link layers. A link layer is a method of passing information directly between two single computers. This includes AX.25 and Ethernet, and in fact the formal specification of AX.25 describes it as "a link layer for amateur radio".

A network differs from a link layer in that with a network data can pass over several different links to get from one machine to another; data only traverses a single link in a link layer.

AX.25

AX.25 doesn't form a network. It only provides the means by which data can be reliably exchanged between two computers, via a connection. The main shortcomings of AX.25 are that the person opening the connection must know a route (ie a chain of digipeaters) to the destination machine, and this route can't be more than 8 digipeaters long. This prevents an AX.25 machine from exchanging data with all other AX.25 computers.

This is not to say that AX.25 is useless. In fact, AX.25 is great for local QSOs, or for connecting to the nearby BBS. Most importantly, it can be used as the link layer for a real network.

The BBS Network

The world-wide system of amateur bulletin boards does form a true network, because data (in the form of personal mail or bulletins) can be exchanged between any two computers in the network. It just might take a while! When dealing with a network, two things that are of interest are the addresses used by the network, and how the machines route data over the network.

Bulletin boards are known by their hierarchical names, which indicates the basic geographical location of the BBS. For example, the main BBS in Canberra is **VK1KCM.ACT.AUS.OC**, which says that VK1KCM's BBS is in the ACT in Australia, which is in the Oceania region. Why are hierarchical names needed? There are two reasons: the link layer used and the method of routing.

"The bulletin boards use a pass the buck method of routing mail."

BBSs typically use AX.25, AMTOR, PACTOR and satellites to pass on bulletins and mail. They could also use modems over leased lines or the telephone system, although this would be illegal according to the amateur regulations. There is no guarantee that the types of addresses on each of these link layers are going to be the same.

To resolve this possible problem, the BBSs use a common name format, and *map* their hierarchical names to the addresses on the link layer. This ensures mail and bulletins can be forwarded regardless of the types of addresses used on the link layers.

The second reason for the hierarchical names is that they make routing the mail easier. The bulletin boards use a "pass the buck' method of routing mail. If I can send the mail direct to the destination then do so, otherwise, forward it to someone else who will have a better chance. The hierarchical names permit forwarding on a *geographic basis*. For example, given some mail for VK1XWT@VK1KCM.ACT.AUS.OC, a bulletin board forwards the mail as follows:

- If I can send the mail to VK1KCM, then I'll do that.
- Otherwise, if I can send the mail to another BBS who knows how to get mail to the ACT, then I'll do that.
- Otherwise, if I can send the mail to another BBS who knows how to get mail to Australia (AUS), then I'll do that.
- Otherwise, if I can send the mail to another BBS who knows how to get mail to Oceania (OC), then I'll do that.
- Give up!

The method used to forward the mail and bulletins is irrelevant, as long as they eventually reach their destination. This is what makes the Bulletin Board system a network.

NETROM

NETROM nearly forms a network. It has the characteristics of a network; different computer addresses than those used on the link layer and forwarding of data (packets here, not bulletins). However, NETROM can't get data from every NETROM node in the world to every other. The reason for this is NETROM's routing method.

Instead of using a hierarchical naming scheme to route data as with the bulletin boards, each NETROM node keeps a routing table which holds routing entries for many destination NETROM nodes. Each entry contains the destination node's NETROM address, and the next NETROM node to forward packets for the destination. Again, a "pass the buck" method of data forwarding is used.

Because NETROM doesn't use a hierarchical method of routing, each NETROM node must *learn* routes to other nodes. This is done by regularly broadcasting the node's routing table, and receiving other nodes' broadcasts. Broadcasting allows node names and routing information to pass around the network (like bulletins), allowing nodes to discover routes to very distant destinations.

What prevents NETROM from forming a true network is the limit on the routing table size in each NETROM node, on the order of 100 entries. This limit prevents a NETROM node from learning routes to all but the nearest 100 destination nodes, effectively limiting the size of the NETROM network.

NETROM has another shortcoming, in the area of services for the user; it only provides a reliable connection, like AX.25. This usually isn't a problem if you only want QSOs, but limits the applications that can be provided by the network.

TCP/IP

TCP/IP does form a true network. It can use many different forms of link layer (AX.25, Ethernet, SLIP and fibre-optic

FDDI for example), and can route data, in the form of packets, between any two TCP/IP machines.

Because TCP/IP runs on link layers with different addresses, it uses its own network addresses. These take the form of 4 bytes, usually written as four decimal number separated by dots, e.g 44.136.7.129. To make life easier for us humans, TCP/IP systems usually allow textual names (like *minnie.vk1xwt.ampr.-org)* which the system maps to the 4 byte address.

TCP/IP routing is a sort of cross between the methods used by BBSs and in NETROM. Each TCP/IP node has a routing table, but instead of having routes to individual machines, the table holds routes to groups of machines. A group usually has 2 or 3 bytes of TCP/IP address common. For example, 44.136.3.XXX hold the addresses of the 1200 baud TCP/IP computers in the ACT, and 44.136.XXX.XXX holds the addresses of all the TCP/IP computers in Australia. This is analogous to XXX.ACT.AUS.OC and XXX.AUS.OC in the bulletin board system. Because TCP/IP routes using groups, a node's routing table can be kept to a reasonable size.

Another advantage of TCP/IP is that, instead of providing a single connection, TCP/IP allows any number of connections to/from a TCP/IP node. An incoming connection is directed to a port, with different ports providing different services. For example, to open a standard QSO with a TCP/IP node you would connect to port 87. To connect to the node's BBS you would connect to port 23, and to transfer a file to/from the node you would connect to port 21. And TCP/IP allows you to have multiple connections to/from your node *simultaneously.*

The idea of ports has allowed several standard applications to be added to TCP/IP File transfers, mail exchange, bulletin boards and DX clusters are just some of the applications that are available with TCP/IP. And because all of these can be used at the same time, you can be getting a copy of the latest PKZIP from one destination while you chat away to your friend on another destination.

Conclusion

The amateur service has three main networks: the bulletin board system, and the NETROM and TCP/IP networks. Each allows the exchange of data between nodes on the network, over different link layers.

Currently, the BBS system and NETROM are the most popular of the three, because you can use the networks with just a TNC and a terminal (as long as there is a BBS or NETROM node near you). TCP/IP, although not as popular, provides a wealth of services that the other two don't. However, the statement that you need a fast PC and special software to get into the TCP/IP network is a fallacy; all amateur TCP/IP nodes allows AX.25ers to connect in and use the TCP/IP services, just like the NETROM nodes.

Each of these three networks fills a need in the amateur community, and as each gives different services to their users, I can safely say that all three will be with us for a long time to come.

PS: I did not discuss ROSE, as I do not know enough about it to describe it competently. I'd love to hear from someone who does.

* *99 Brigalow Street Lyneham ACT 2602*
ar

WIA News

Successful Membership Campaign

The NSW Division achieved significant success with a membership recruitment and retention campaign conducted between December 1 last year and February 28 this year. These three months are when the greatest percentage of member renewals are due, and the campaign was timed to coincide.

Two Kenwood transceivers were offered as prizes in a draw for all members who renewed and for new members who joined during the period. Those members who had three-year memberships covering the period were also included.

Before the campaign commenced, Kenwood Electronics Australia was approached by a Divisional Councillor to sponsor the campaign. The company generously provided two transceivers; a TH-28A two-metre handheld (recently released here), as a second prize, and a TM-732A dual-band two-metre/70 cm mobile rig as a first prize. Total value of the prizes was almost $1800.

In addition, Kenwood supplied 100 DXCC world map "place mats" which were sent out to new members who joined during the campaign.

The prizes were drawn by Joshua Mui of Kenwood at the Division's annual general meeting on Sunday 9th May.

First prize went to John Wilmott VK2AJX, from Bowral (a country member), while second prize went to Noel Black VK2TNB, of Blakehurst and a member of the St George Amateur Radio Society.

The winners were presented with their prizes by Kenwood's Gilbert Kwok VK2GKT at a short ceremony before the St George ARS meeting held on June 2nd, which was organised by NSW Divisional Vice President, John Robinson VK2XY.

The membership campaign was heavily promoted via the Division's Sunday broadcasts, via the VK2 Notes in A.R., a prominent notice at the Division's headquarters in Parramatta, and at the Central Coast AR Club's Field Day held at Wyong on Sunday the 28th of February — the last day, when 10 new members were recruited!

The Federal Membership Statistics performance report shows that significant positive growth in membership occurred, with eight members above projected membership being reported for January, 90 for February, and 132 for March. (many new members recruited in February could not be added to the membership register by the Federal Office until March, after processing by the Division, hence the lag).

The NSW Division membership stood at 1714 members as at the end of March, giving it the highest membership of all Divisions, just seven ahead of Victoria. The NSW Division had good cause to sincerely thank Kenwood Electronics Australia at their AGM for their generous support!

EMC Report

*Hans Ruckert VK2AOU**

1) QST April 1993 Car Airbags and Amateur Radio

The title, Don't Get Blown Away by Your Mobile Rig! This is not an April Fool joke. Federal US law also mandates passenger-side airbags in all new cars by 1998. When installing amateur radio mobile equipment in a car, one has to make sure the airbag is not hindered by equipment. When inflated, airbags generally fill the space from driver's and passenger's lap to the roof of the car. Manufacturers like Chrysler and General Motors have issued guidelines for the installation and use of added-on equipment. The circuit components which trigger the deployment of airbags must be so designed that RF from the mobile transmitter will not trigger the airbag's deployment.

2) EMCU (U stands for Umwelt = Environment in German)

Experts and scientists from various faculties of universities attended the Euroform Conference at Bad-Homburg (Bad = Bath, resort). News media reports brought sensational reports about RF radiation and human health. Fantastic, and apparently invented, claims were published to alarm the public, and to sell papers and TV time. It had therefore become necessary to determine whether beliefs were facts or only unfounded fantastic assumptions. For example: Do radio waves cause cancer? Is the health of people affected if they live near telecommunication towers, including those of radio amateurs?

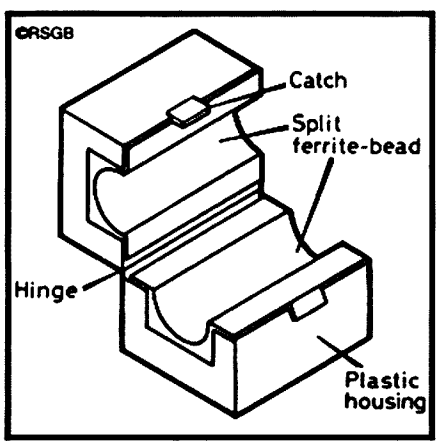


Figure 1 — Computer data line from Maplin

3) Personal experience of some radio amateurs:

I was for seven years in charge of the electronic lab of the Rosenthal Co at Selb, Northern Bavaria, prior to emigration to Sydney in June 1951. The rooms of this lab were attached to the high voltage laboratory, a concrete cube-like building of 25m per side. Two of my 41m-long wire antennas were attached to top corners of the building. The other ends were attached to the window of our lab on the second floor. The high voltage lab had the following testing facilities: A 2.3-million-volt pulse generator, charging capacitors in parallel with about 100,000v and discharging in series, with a mighty flash and bang! A 1.2-million-volt step-up transformer with separate AC generator of about 2000v, and a motor to select the voltage. The whole building shook when 4m-long arcs were generated. With salt-water spray the arc was even longer. Internal balconies were at various levels for observers and for the remote control of the generators and insulators under test. It was in the true sense of the word "a hair-raising experience", because under dry-weather conditions the hair of the observers stood straight up!

None of the technicians and engineers operating this equipment, nor we, the 12-15 persons in the electronic lab next door, nor the families of the company directors living 50-100m away (DL6NH was the son of our director) suffered any ill effects. I have no medical problems, being 80 next year. Also, the Dr Ing who was in charge of the tests is still around and well. He is 84.

The 1m-long 100,000v rod insulators displayed corona discharge and RFI in the vicinity at even only 6000v applied. The metal caps had to be ground smooth along the casting seam. In another test field building nearby, all day long hundreds of dish-like insulators (for insulator chains) were breakdown tested at about 100,000v inside a safety wire cage, causing plenty of arcing, because a spark gap ring was used to find quickly any broken-down insulator. This caused more high voltage radiation (and RFI to radio reception).

Prof Dr Ing Geiger (of Geiger counter fame) did not mind standing on an insulating stool and demonstrating the radiation of a Van der Graf generator operating at 1,000,000 volts at the Technical University of Berlin Charlottenburg in 1939. His whole person was illuminated by the radiation. We may not like high voltage power lines above or near our houses because they cause severe interference to radio, shortwave and TV reception, but there are many popular human activities which are well known to be unhealthy, which should be blamed first, if our health is affected by some condition.

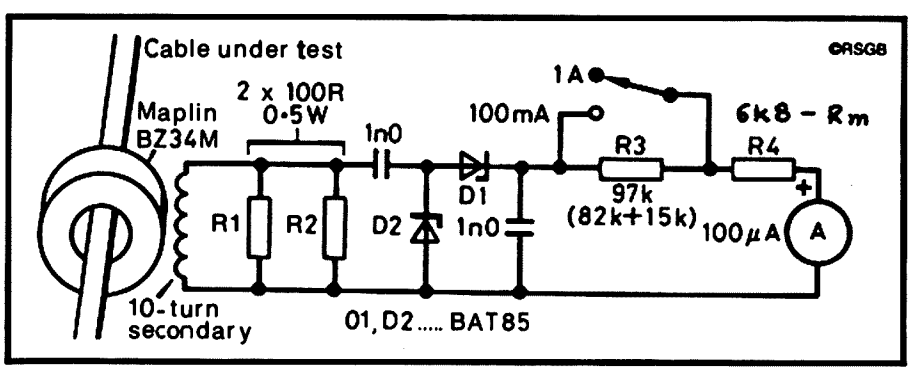


Figure 2 — This simple but effective RF ammeter is suitable for HF use.

4) EMC: Radio Communication (submitted by Norm Burton)

August 1991: Teleswitch

The switch interferes with all reception over the 0.15-30 MHz range, especially amateur radio operation, using only μV signals, which often is disturbed. Therefore present EMC standards are only partly adequate. The EMC Committee is concerned that amateur radio communication will be affected when electronic power meters are used to measure electric power consumption. The susceptibility of certain PIR alarm systems was greatly reduced by fitting ferrite sleeves over the six-core incoming cable where it enters the detector housing.

An EMC committee member discovered he caused his neighbour's PIR-operated lighting to come on when he turned his beam around while not transmitting! The conclusion was that the beam appeared "warm" against the cold background of the night sky, and so the movement triggered off the sensor (what next?).

October 1992

Electronic heating controllers are known to cause RFI to 3.5 MHz operation. These controllers have also triggered house alarms. RC filters are mentioned to overcome the problem. Some gas heaters also cause trouble, which can be overcome by the manufacturer. RF leakage severity vs manufacturing cost is discussed. Gas discharge lamps energised by RF were also tested.

December 1992

Using filters and/or ferrite rings is far more effective than reducing the power of an amateur radio transmitter. Testing toys for the boys: EMC testing re susceptibility and interference is described on train sets and other toys. We quote from the RSGB publication "The Radio Amateur's Guide to EMC".

EMC Problems Caused by Equipment

Amateurs and SWLs have their own EMC problems as well. How often have you been straining to catch that rare DX and the central heating turns on? Well, thermostats share joint honours at the top of the table with computers as the biggest cause of unwanted noise. The pie chart below illustrates the results.

The other category covers a very wide range. The following problems were reported:

- Telephone exchange
- Lawn mower
- Welding
- Compressor
- Drill
- Vacuum cleaner
- TV time base
- Spark eroder
- Cable TV
- Cordless phone 2nd harmonic.

Thank you again to those people who filled in survey forms.

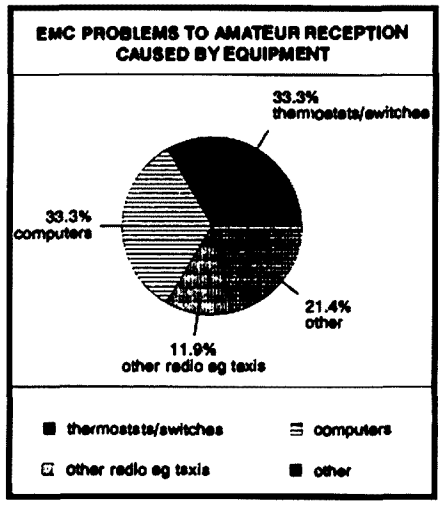
Types of Equipment with EMC Problems

The survey showed that televisions are still the top of the league table of equipment susceptible to RF so TVI is still a good description of a typical EMC problem. The league table is as follows:

1. Televisions
2. Telephones
3. Hi-fi and video recorders

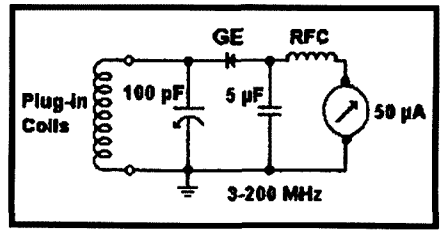
April 1993

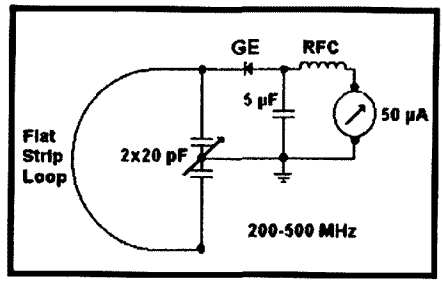
An RF ammeter is described, which uses two half-ferrite rings or cylinders clamped around the cable. Refer to figures 1 and 2. The cable acts like the primary winding of a transformer. The RF transformer's secondary winding of 10 turns is connected to load resistors, a diode rectifier and by-pass capacitor, range resistor and a 100 μA meter.



5) An absorption type frequency meter as RF sniffer

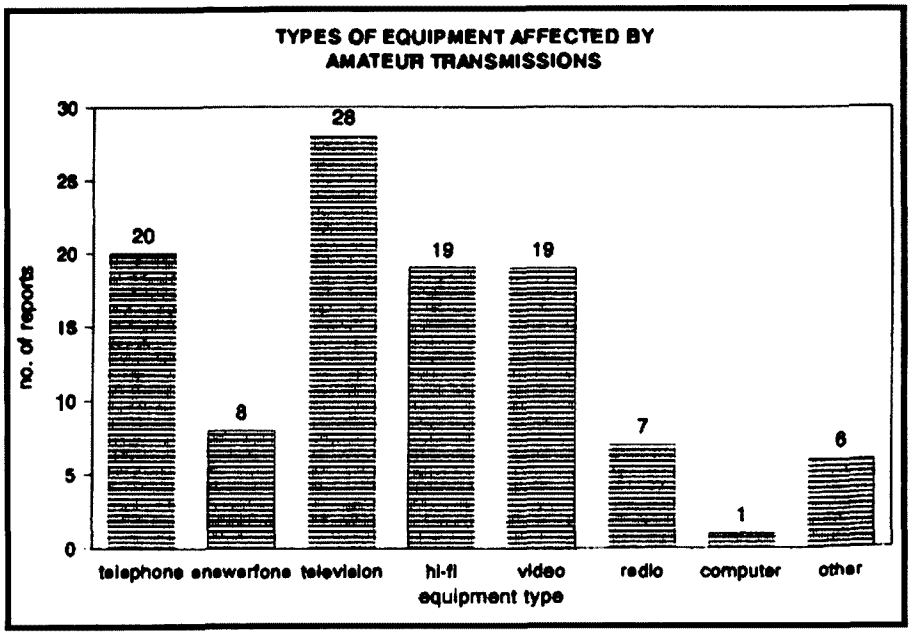
These sniffers will detect RF leakage along edges of transmitter cabinets, attached cables from the key or microphone, cables between the transmitter final and the power supply, the main cables, and also along coaxial cables. The circuits are described in figures 3 and 4. The sniffer should also be tuned to harmonics of the transmitter fundamental frequency. This sniffer can be calibrated with a GDO or signal generator.





* 25 Berrille Rd BEVERLY HILLS NSW 2209

ar



Repeaters — additions, deletions. Have you advised the WIA of changes needed to the repeater list.

Divisional Notes

Forward Bias — News from the ACT Division

Christopher Davis VK1DO

Attendance at our monthly general meetings has been most pleasing despite the chilly weather. A large gathering of enthusiastic amateurs watched in amazement during a demonstration of feedline losses at our May meeting. Hopefully, stronger and more effective VHF stations will result. A keen group of locals had a fascinating tour of the studio and transmitter site of radio station 2CC as part of our June meeting. Our thanks to Jim VK2UZ for organising and hosting this event.

In the second week of June our courses and classes started again with tuition within the subjects of AOCP theory and morse, both five and 10 words per minute. Although the course is already under way it might be possible to still enrol these few weeks into the course. Please contact Ted VK1AOP on 295 9193 for further details.

Our division has settled into a comfortable pattern of regular exam events, with one held in the first week of June and the next one being planned for early September; the final exam for 1993 being intended for November to coincide with the completion of studies for students in the AOCP classes. For further details on examination times, dates and venues, please telephone Jan VK1BR on (06) 291 7123.

The technical presentation at our July meeting will include details of equipping your amateur station for simultaneous transmission on more than one band using a common audio system: ie, one single microphone as is desirable for broadcasts. This topic will cover audio decoupling, common earths desirable for both RF isolation and improving the safety of your station in relation to potential electrocution. A description of control systems suitable for monitoring repeater time-outs vital for broadcasts as well as a demonstration on how an automated broadcast is being carried out with a conventional tape-deck controlling transmit keying.

Our division's beacons have been removed from their previous home at Melba, and, apart from 144.410, have been taken off air pending a new location and some improvements in terms of antennas and spectral purity. The 144.410 beacon is operating on a halo antenna in the Weston Creek suburb of Duffy. This location is enabling a reasonable signal to be heard in Sydney, although no confirmations of its reception in Melbourne have come to hand. The present antenna system is only an interim while plans are refined to restore the system to a more effective ERP.

Our July meeting will return to our usual venue of the studio room at the Griffin Centre where the facilities of our office are immediately adjacent. Our office has progressively been rationalised in terms of its opening hours, with only Saturday mornings currently manned. We are, however, short of personnel for manning the office, with a small number carrying the load. At least another six people are needed, not only to fill up the four Saturdays of the month, but lighten the load on our present team. Please remember our broadcast times have moved to be principally Monday evening with a repeat on the following Wednesday. Please consult the useful listing of information on page 3 of *AR* each month.

73 de VK1DO

VK2 Notes

Tim Mills VK2ZTM

Membership Campaign

This ended in February and was drawn at the AGM. The prizes were made available to the Division by Kenwood Australia and Joshua Mui, and Gilbert Kwok VK2GKT attended the AGM and Joshua drew out the winners. First prize of a TM-732A dual-band 2m/70cm rig was won by Mr JH Wilmott VK2AJX of Bowral. The second prize of a TH-28A hand-held 2m rig was won by Mr NF Black VK2TNB of Blakehurst.

The winners were presented with their rigs at the June meeting of the St George ARS by Gilbert VK2GKT on behalf of Kenwood and the NSW Division. Our thanks to SGARS for making the prize presentation possible. Special thanks to Kenwood Australia for making the donations available.

The campaign boosted the Divisional membership by 102 members over the forecast gain. NSW membership as at the end of March stood at 1714.

The Annual General Meeting

Held on 9 May last, it was well attended and went from 2pm to almost 8pm. This year there was a ballot to determine the council members for 1993/94. Over a third of the membership returned a vote. There were 12 candidates for the nine positions. The election result was as follows:

Sandy Brucesmith	VK2AD
Roger Harrison	VK2ZTB
Roger Henley	VK2ZIG
Julie Kentwell	VK2XBR
Rob Lloyd-Jones	VK2YEL
Tim Mills	VK2ZTM
Erich Reimann	VK2WH
John Robinson	VK2XY
Terry Ryeland	VK2UX

There was a tied result for the ninth position which was decided on a draw. Peter O'Connell VK2EMU was reappointed as returning officer.

Many hours of the AGM were spent discussing the commercial communications tower facility at Dural. A detailed general report of the project's history and development was presented by the 1992-93 secretary, Bob Lloyd-Jones VK2YEL. This was followed by a lengthy question-and-answer period, which cleared up many misconceptions and much misinformation which had circulated in the weeks leading up to the AGM.

The new council is to call a special general meeting later in the year to report further progress on the project to members.

The principal office bearers for 1993/94 are: President, Terry Ryeland VK2UX; Vice Presidents, John Robinson VK2XY and Roger Harrison VK2ZTB; and Secretary/Treasurer, Bob Lloyd-Jones VK2YEL.

New Members

The following recently became members of the VK2 Division, and our usual warm welcome is extended to them.

J	Jose	Amorim	VK2GXW	Newtown
SM	Sylvia	Burkitt	VK2SUN	Parramatta
M	Mirel	Cardoso	VK2BOD	Cabramatta
SS	Samuel	Clark	VK2YCS	Sydney
BJ	Brett	Dawson	VK2CBD	East Ryde
AG	Alan	Edge	Assoc	Edgeworth
GF	Glen	English	VK2JPR	St Ives
NC		Farley	VK2XVW	Gloucester
MR	Malcolm	Green	VK2SMG	Guildford
S	Stuart	Lamb	VK2STU	Buronga
PA	Paul	Rigg	VK2XXD	Manly Vale
B	Bernard	Saavedra	VK2BSL	Sydney
Y	Yong-ah	Song	VK2TCJ	Chatswood

Happening/Coming Up

Next Trash and Treasure at Parramatta on Sunday afternoon 25 July. Next exams conducted at Amateur Radio House will be Sunday afternoon 29 August. The closing date for applications is 12 August. A reminder to amateurs and repeater groups that any corrections or alterations to the next edition of the Callbook should be sent in NOW to the Divisional office. Deadline is upon us. At the time these notes were being prepared the Division was still in need of a Broadcast Officer to compile the Sunday broadcast script. In fact, several people are required to form a team to share the workload. This would enable the team to operate on a roster. Richard VK2SKY, the retired Broadcast Officer, has prepared a full job description so no-one goes in cold. In the meantime, the broadcast has been prepared by members of council.

NTAC

The committee for the NSW Technical Advisory Committee for 1993/94 year is chaired by Cesar Miranda VK2TCM, with Bob Mayer VK2BMU and John Simon VK2XGJ on committee.

5/8 Wave

Rowland Bruce, VK5OU.

I sometimes wonder what I am going to put in this column month by month. Really, I think, it ought to report on happenings within the division, and give some idea of future events and even policy thinking of Council etc. However, being away as much as I have this year, I find that on occasions I am reduced to musings and ruminations. At other times, of course, one can report on some event or other which is out of the ordinary. So it is this month.

Ian Watson, WICEN Co-ordinator, will prepare an article for future publication on the Great South Australian Bike Ride, but here are some preliminary details on what was a most successful event.

Twenty-six South Australian amateurs, ably assisted by eight Victorians and even one Taswegian provided the communications expertise for the ride, which involved over a thousand riders covering about 100 km a day. The Tassie was a participant who rode alongside one of the sixteen doctors and provided mobile communications when needed. There were also eight nurses and six St John's units involving fifteen St John's members. In all, 300 volunteers serviced the thousand riders.

Communication was primarily on two metres using firstly the Barossa and later the Houghton repeaters. With a five am start and six pm finish, one would have thought that the ops would have been eager to call it a day, but I understand that searches of hilltops for future repeater sites was a regular night activity. All in all it sounds to have been an event to remember, and quite an eye-opener for those who had not participated in anything similar before. Well done, and thanks for the good publicity!

Talking of the Houghton repeater, which is on 146.825 MHz, the North East Radio Club has been given permission to use it to run a club net, but at the moment I do not have any details on the day or the time. Keep an ear out for them.

Clubs should note that at the last Council meeting John McKellar, VK5BJM, was appointed Club Liaison Officer, (QTHR).

The latest tuition course has come to a conclusion. By the time you read this I would hope that we have some more suitably qualified applicants for Amateur Radio licences.

Finally, to revert to my opening musings. Please let me have details of things you, or your club or an amateur of your acquaintance have achieved so I can fill 5/8 Wave with happenings in the coming months. Many thanks.

73
Rowland Bruce
ar

Club Corner

Summerland Amateur Radio Club — Hamfest

Sunday 1 August is the date for the SARC Annual Hamfest. Bring and buy stalls — heaps of treasures awaiting discovery — disposal tables.

Packet demo — HF and VHF stations operating. Trade displays. Maybe a radio foxhunt. Refreshment available (barbecue, tea, coffee, drinks etc). The venue is our clubrooms at Richmond Hill via Lismore. Commencement time is 9.30am.

All amateurs and other interested folk are very welcome to come along to meet the guy on the other mike and to have a good day. Bring your trailer and your money.

For more information, please contact Peter VK2FSD, (066) 25 2334; Ric VK2RIC, (066) 89 5137; Graeme VK2GJ, (066) 85 1336; or on packet radio: VK2EA-2, VK2EJV-2 or VK2YDN-1; all via VK2RPL-2, 668900.

Note your diary now: Sunday 1 August at 9.30am. SARC Hamfest, Richmond Hill, Lismore.

Graeme Virtue VK2GJ
Publicity Officer

Moorabbin and District Radio Club

The annual general meeting of the club will be held on Friday 16 July at 8pm. Hopefully all members will give serious thought to the election of office bearers to carry on the good work of the present team.

Members are reminded that written nominations must be in the hands of the secretary a clear seven days before the meeting. Nomination forms are included in the current issue of the club's newsletter APC, now being prepared.

Our speaker at our August meeting will be telling us about the Jindalee over the horizon radar, so this is a good date to put in your diary: Friday 20 August.

Plans are well advanced for club station VK3APC to take a very active part in both the novice and RD contests.

Allan Doble VK3AMD

Radio Amateurs Old Timers Club

Members are reminded that we now have an evening re-transmission of our regular morning program on 80 metres hoping to reach members and other listeners who are unable to listen to any of the morning transmissions.

The preferred frequency is 3.635 MHz or higher, depending on QRM. The time is 8.30pm.

Ron Fisher VK3OM, backed up by John Fullagar VK3AVY, are the operators for this effort.

Allan Doble VK3AMD

Geelong Grammar School Hobby Expo 14-15 August

The Geelong Amateur Radio Club VK3ATL and the Geelong Radio and Electronics Society VK3ANR have been invited to participate in a "hands on" hobby expo to be held at the Highton campus of the Geelong Grammar School on the weekend of the RD contest, 14 and 15 August.

Both clubs will be attending and will hold a joint display to enlighten the public attending to a variety of aspects of our hobby.

Interested members of the public will see a working HF radio station and will be invited to log onto the GARC PMS and print out information on the GARC, GRES and WIA. Prospective radio amateurs will

receive a complimentary information package containing material on the clubs, the WIA, amateur licensing and equipment suppliers.

Both clubs will be participating in the RD contest and will be looking to make contacts on HF during the expo, so look for the callsigns of both clubs and check in for a chat and a number for the contest.

Albert (Bert) Gnaccarini VK3TU

Geelong Amateur Radio Club

The Geelong Amateur Radio Club VK3ATL meets every Friday evening at its own clubrooms at Storrer St, East Geelong. General meetings are held on the first Friday of each month commencing 8pm and operating nights, technical lecture evenings and social activities are regular features of the club's syllabus.

Wednesday and Thursday evening NAOCP classes are held at the clubrooms for YLs, XYLs and harmonics by Lee VK3PK who also manages to find time to teach the advanced novice and AOCP class each Friday from 7.00pm.

The club boasts a comprehensively equipped shack with excellent facilities from 80m through to 2m SSB as well as a new packet PMS. The club callsign can be heard on HF on many Friday evenings, particularly on scheduled operating nights when the club station is put to air by members.

Information about the club or its activities is available on the VK3ATL PMS and messages can be left on the BBS via VK3ATL @ VK3IBM. For those not equipped with packet, either write to GARC, PO Box 520, Geelong Vic 3220, or come along any Friday evening.

Albert (Bert) Gnaccarini VK3TU

Geraldton Senior High School

VK6AGN, the callsign of the Geraldton Senior High School, is once again on the airwaves. The club was started approximately six years ago by the then principal Mr Tom Tuffin, and after two years of silence can once again be heard on 14 MHz every Monday afternoon from 0730-0800 UTC.

The enthusiasm of Geraldton Amateur Radio Club members Bob Hollingshead VK6KI and Bob Marlow VK6PJ have helped Mark Lynch (teacher) to give the students of the school an opportunity to listen and speak to people both nationally and internationally. In addition to learning for the novice licence.

The kindness of Bob Marlow in allowing the school to use his Kenwood TS520 (while our Yaesu FTDX560 is being reconfigured) has helped the club to be kicked off again. Mark was very surprised (and scared 20 metres above the ground) after he and Bob climbed onto the top of the school to inspect the Yagi triband antenna. The wiring to the antenna had corroded and completely broken. No wonder we couldn't hear too much. Within an hour Bob was back up the mast and made the Yagi come to life again.

"My granddad's got one of these," was commonly heard at our first meeting, and it is this relationship that sparks interest for young people today. It is very pleasing to know there are kids in our schools wanting to continue in the hobbies of their grandfathers; maintaining a tradition if you like.

We have four students attacking the regulations and morse with relish at the moment and, hopefully, it won't be too long before we hear they have their own callsigns. For the moment they are still keen to turn the dial, locate a QSO, call CQDX, or talk to callsigns whenever the opportunity arises.

Many thanks must go to Bob Marlow VK6PJ, not only for the use of his radio, but also for his dedication in coming up to our radio shack every Monday and helping us out.

We thank the following callsigns who have given valuable time to talk to us on a Monday: VK3VQ; VK2CJM; VK3GEE; SM5GZ; HC8A; ZL2FF; EI7CV; EI8EQ.

We look forward to further QSOs and ask that if you've time, please listen out for the kids on VK6AGN, club station for Geraldton Senior High School.

Mark Lynch
179 Gregory St
Geraldton WA 6530
ar

Pounding Brass

*Stephen P Smith VK2SPS **

To start with, we amateurs should bow our heads in honour to Gilbert Griffiths VK3CQ for his excellent efforts in producing Pounding Brass over the many years it has run in this magazine. To come up with a new topic each month for us amateurs, plus family and work commitments, is something to behold. Let me say thank you Gilbert, from myself and the rest of the amateur community for a job well done.

You now must be wondering who I am and what I've got to offer to this column. Well, to start off with, I'll give a little history about myself, then go on to explain how I see this column going in the next few months or so.

"The man who started it all, Samuel Morse."

Born in Sydney in the early '60s, I have spent most of my life on the northern beaches. Attended Narrabeen Primary School where I was introduced to amateur radio and electronics in general. My interest grew in this exciting field, building my first crystal radio at about age 10, and gaining my Novice at 16 while attending Narrabeen High. One of my main interests was constructing low-power (QRP) CW transmitters. I can still remember that first on-air QSO with an amateur on 80m, with something I built myself.

I finished high school and joined Army Special Forces, which gave me a solid grounding in using state-of-the-art equipment in both CW and SSB-type modes. I did my fair share of travelling, visiting many interesting countries.

Upon leaving the Army I went into the communications field, getting a job with Telecom and spending most of my time in telephone exchanges.

I attained my Electronic and Communication Certificate from North Sydney College, then later my Full Call licence.

I'm still currently with Telecom, situated at Mosman, Sydney, where my duties include the maintenance and testing of electronic switching equipment called ARE and AXE.

Other interests include camping, travel, rock-fishing and, of course, DXing. Personally, I must say I'm very honoured to be able to write this column and will do my best to maintain the high standards required.

Let's get down to business. Where do I see this article going now and into the future?

If Morse code is going to survive in this day and age we must get the younger generation more involved, because these people will carry it into the 21st century. So, if you hear a CQ from a newcomer, give them a chance. Have a QSO with them even if it means reducing your speed. Remember, we were all beginners once. My approach will be back to basics. In the next few issues we will begin with

a two-part series on the man who started it all, Samuel Morse, covering his early history up to when he invented the now-famous Morse code.

Then we move on to early telecommunications here in Australia, how Morse code came into being, how it spread and how it changed the face of communications in those early years.

In further issues, we will cover topics such as:

1. Types of code used past and present.
2. How to learn the code.
3. How to increase your speed.
4. How to answer a CQ call in the correct manner.
5. Equipment used, straight keys to iambic keying.
6. From Morse code practice oscillators to computer-generated Morse.
7. Morse scene from overseas.
8. Morse used in the armed forces. Styles of training used by the different branches.
9. Projects from the novice to the full call.

The list is endless; I'll leave a few surprises for later issues. I might even throw in some questions at the end of each issue, just to get you thinking. No answers, of course. They come in the next issue.

The thing to remember is that this is your magazine. Input from you, the reader, is very important to me. Tell me what you think, and what you want. Maybe even a funny story relating to an on-air CW contact so we can pass it on to our readers.

To the novice and the people who are studying for a VK call, if you have any questions relating to Morse code or related subjects, even if you think the question is silly, drop me a line and I'll do my utmost to answer it for you.

Remember next month's issue is on Samuel Morse, the man who started it all!

Until then, 73

Please forward correspondence to me at the address below.

* *PO Box 361 MONA VALE, NSW 2103*

ar

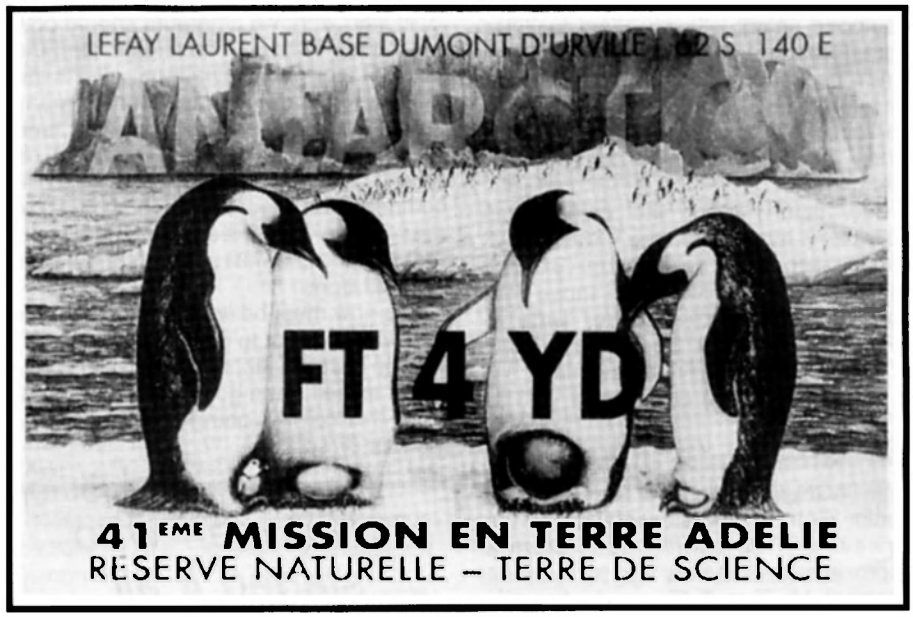
ALARA

*Robyn Gladwin VK3ENX**

The New ALARA Year

After the recent Annual General Meeting, ALARA is pleased to announce the new Office Bearers.

President		Maria McLeod VK5BMT
Imm Past President		Jenny Warrington VK5ANW
Vice-President		Christine Taylor VK5CTY
Vice-President		Judy Atkins VK3NYL
Secretary		Bron Brown VK3DYF
Treasurer and Souvenir Custodian		Margaret Schwerin VK4AOE
Minute Secretary		Christine Taylor VK5CTY
Publicity Officer		Robyn Gladwin VK3ENX
Award Custodian		Jessie Buchanan VK3VAN
Historian and Contest Manager		Marilyn Syme VK3DMS
Librarian		Kim Wilson VK3CYL
Sponsorship Secretary		Poppy Bradshaw VK6YF
Newsletter Editor		Dorothy Bishop VK2DDB
State Representatives	VK1/2	Dorothy Bishop VK2DDB
	VK3	Bron Brown VK3DYF
	VK4	Margaret Schwerin VK4AOE
	VK5/8	Meg Box VK5AOV
	VK6	Poppy Bradshaw VK6YF



Birthday Celebrations

The 4th Saturday in July is ALARA Birthday Activity Day from 0800 to 1200 UTC. This year the date will be 24th July. Suggested frequencies are 3.588, 14.288, 21.188, 28.588 and 28.688 MHz.

ALARA was formed in 1975 by a group of women only some of whom were already amateurs. The foundation President was Norma Boyle VK3AYL (now VK2DJO). There are now over 200 members throughout Australia and, through our Sponsorship scheme, in many overseas countries. The main aim of ALARA is to encourage the active participation of women in amateur radio and we hope this Birthday Activity Day will provide an opportunity for other radio amateurs to help us celebrate on air.

Interesting DX

For me, speaking to people in distant lands is still one of the great pleasures of amateur radio. I was thrilled to receive this attractive QSL card from the French Antarctic base at Dumont D'Urville.

33

* *PO Box 438 Chelsea 3196 VK3ENX@VK3YZW*

ar

Awards

John Kelleher VK3DP Federal Awards Manager

NZART Awards

When applying for NZART Awards, courtesy demands you observe the following: (1) print your name, address and callsign; (2) clearly state what award you are applying for; (3) supply checking sheet with callsigns, dates of QSOs, mode etc; (4) enclose required funds as requested. Stamps or currency from any country accepted instead of IRC, but cheques NOT desirable.

Post applications to Awards Manager ZL2QK, 5 Townley St, Gisborne 3801. New Zealand. Overseas applicants pay $2 for each NZART award, except WAP (4) and 5x5 ($3). Airmail postage is $1 extra.

The most popular awards use WAP for contacts with 30 Pacific countries (eg those which count for Oceania for WAC) followed by NZC (New Zealand Counties) for which the basic requirement is contacts with 20 different NZ counties. Endorsement for 40, 60, 80, 100 are made with a special certificate for all 112. Next is the WAZL for contacts with 35 different branches of NZART. A branch list is available for $1 and SASE.

The WAD is a VHF Award for contacts on any VHF band with ZL1, ZL2, ZL3, ZL4 — one contact per call area. Cost $1. Endorsements for satellite QSOs.

The IARU Region 3 Award

This award is available to licensed amateurs and SWLs, for contacts from 5 April 1982 inclusive. QSL cards are not required, just certified logbook entries. Eligible countries are Australia, Bangladesh, Brunei, China, Fiji, French Polynesia (FO8 only), Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Pakistan, Papua-New Guinea, Philippines, Singapore, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu. PLUS, one country credit from US territories in the Pacific from Guam, Northern Marianas, American Samoa, Wake Island and Baker-Howland group. Additionally, one country credit from Pitcairn Island, Chagos Archipelago. Current total of available countries is 24. The Award dates from 1 January 1986. Basic Award seven areas; silver endorsement 15 areas; gold endorsement 20 areas.

There are numerous other small awards available, but these are the most popular by far.

MALAYSIA

The Malaysian Amateur Radio Transmitters" Society (MARTS) issues the Worked All Malaysia Award to amateurs who work and confirm two 9M2 contacts, and one each with 9M6 and 9M8. The Award and endorsements are issued for 2xSSB, 2xCW and 2xRTTY, mixed or single band, mixed or single mode, for contacts on or after 31 August 1957. Send a certified list and $US5 to MARTS Awards Manager 9M2FK, PO Box 13, Penang, Malaysia.

MALTA

The Malta Amateur Radio League (MARL) issues the Dip Med Award for having worked and confirmed 15 of the 26 Mediterranean countries from the list below. A 9H QSO is mandatory. Send a certified list and $US3 to MARL, PO Box 575, Valetta, Malta. The country prefixes are CN, EA, EA6, EA9, F, I, IS, IT, OD, SU, SV, SV5, SV9, TA, TK, TZ, YK, YU, ZA, ZB, 3A, 3V, 4X, 5A, 5B and 7X.

JORDAN

To apply for Royal Jordanian Radio Amateur (RJRAS) Awards, applications must be accompanied by photocopies of the QSL cards and 10 IRC (or equivalent). Send applications to Awards Manager, PO Box 1055, Amman, Jordan.

(1) The Silver Award, issued by King Hussein JY1, requires proof of working six (6) different JY prefixes.
(2) The Arabian Knights Award is for working 10 Arab countries, one of which must be JY1 or JY2, since 1 January 1971. The Arab countries are A4, A6, A7, A9, CN, HZ, J2, JY, OD, ST, SU, T5, YI, YK, 3V, 4W(?), 5A, 5T, 7O(?), 7X and 9K.

QSL Help

To help some amateurs to obtain confirmation of Russian Arctic and Antarctic station contacts, send your QSLs direct to Yuri Lobatshev, UA10KCL at Chaun QSL Bureau, Box 44, Pevek, Magadanshkaya Oblast 686610.

DXCC Profiles — Austin Condon VK5WO, Laura SA

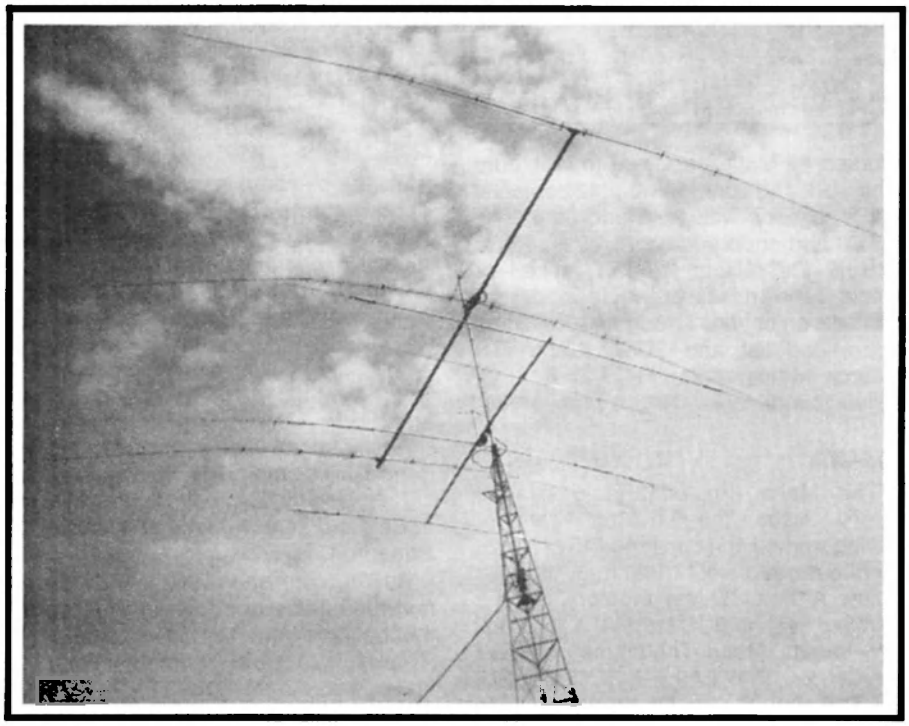
Austin began shortwave and broadcast band DX listening in 1939.

He joined the RAAF in 1943 and served in England as a wireless air gunner, 101 Squadron, RAF on Lancasters.

Austin returned to civilian life in mid-1946 and started as an SWL again, and became interested in amateur radio. He was licensed in December 1949. His first rig was a Type 3 Mark 2 with 25 watts on CW. He was interested in the DX part of the hobby right from the start. During 1953, Austin advanced to a rack and panel AM rig, with parallel 807s and 90 watts. This rig was built from a Bendix TA12B aircraft transmitter and a TU6B tuning unit. He used this rig until 1965. The main antenna in this period was a home-made 20 metre three element beam, and dipoles for 40 and 80 metres.

1965	first black box a Swan 400
1967	changed to TH6DX 10/15/20, which was used until 1984
1970-1981	FT101/FT101E with linears FL2100B and FL2100Z
1981	FT-ONE

Austin Condon VK5WO proudly displays his car with its personalised number plates. A true amateur!



Part of the VK5WO antenna installation, a 3 element KLM 40 metre beam at 62 feet (top), with a CUSHCRAFT A4S for 10, 15 and 20 metres at 50 feet.

1984 changed main antennas to an ATN eight element log periodic. This antenna provided excellent service for nine years.

1986 — Kenwood TS940, and in 1988 added linear TL922.

At present the main rigs are a YAESU FT1000 transceiver, YAESU FL7000 Solid State Linear, and an ICOM IC 761 transceiver with TL922 linear amplifier.

The present antennas are:-

— Mosley Pro 96 (installed March '93)
— three-element KLM 40m
— Cushcraft A4S
— Dipoles for 80 metres and 160 metres

Awards

The first application for the WIA DXCC for phone and open was made in August 1962. The awards manager then was the late Alf Kissick VK3KB.

WIA Honour Roll

Currently 323 countries have been worked on phone and open.

ARRL No 1 Honour Roll. All countries worked phone and mixed.

ARRL 5 band DXCC.

All new countries that have been added to the list during the past six months have been worked and confirmed.

The last country worked to complete the current list was VP8SSI, South Sandwich Islands in March 1992.

Hints for up-and-coming DXers

Most of the previous writers in this DXCC profile section of AR have covered the important aspects very well. DX newsheets such as QRZ DX, DX Bulletin and RSGB DX Newsheet, have been found to be very helpful, with general DX information, QSLing etc. A lot of DX information can be gained from the INDEXA Net 14236 kHz daily at 2330 UTC and 14256 kHz net daily at 2330 also. Both from USA long path. Swapping of DX information with your DX friends.

The hardest country to work was Bouvet 3Y5X.

The best buy in amateur radio was a 70ft DCA tower in 1959 for $120.

The Future

Having worked all the current countries on phone, Austin has only 280 countries on CW confirmed, so has plenty of countries to chase on this mode.

Occupation

He worked and lived in the same hotel for many years, first with his parents, and then with his wife, and ran the business until retirement in 1981.

Austin built a house about four doors away from the business QTH, so there was no great problem in shifting his.radio gear and tower.

Age — Coming 69 years. **ar**

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of :

R G (Reg)	*Morgan*	*VK2ABM*
M H	*Stuckey*	*VK2ARF*
C (Colin)	*Paterson*	*VK2BCP*
G A (Rick)	*Ewin*	*VK3AGC*
R J (Robert)	*Cayzer*	*VK3ATC*
H B (Dick)	*Fitzsimmons*	*VK3RZ*
J C (Cress)	*Clarke*	*VK4AK*
T. (Ted)	*Walton*	*VK4ATZ*
M J (Mick)	*Johnston*	*VK4JI*

Hilary Blanchard (Dick) Fitzsimons VK3RZ

Born at Traralgon, 1/1/1918, Dick, with his parents, moved to Melbourne, settling at Hawthorn. Failing to obtain a Law degree Dick joined the PMG Department as a Technical Officer, working at the laboratories and the short-wave transmitting station at Lyndhurst. He retired in 1976.

Married in 1943, Dick and Gwen raised four children, and now have 11 grandchildren, one of whom, Leigh, recently passed his AOCP test, much to Dick's delight. Dick was a family man, joining in family games etc. He also loved music, piano, records, cards, Scrabble and photography, doing his own developing and printing. A perfectionist, he also enjoyed carpentry and repairing everyday objects.

Amateur radio was his greatest love. He obtained his licence and callsign VK3RZ in 1938. Using home-built equipment he operated on 175 metres as well as other bands. When Victoria was ravaged by bushfires in 1939 Dick operated a radio at Woods Point, providing vital communications.

Tragedy struck Dick with loss of speech due to a cancerous throat operation about two years ago, but by use of an artificial voice production device he was able to communicate.

He passed away on 3 April 1993. The large attendance of family and friends at his funeral service included many amateurs.

Our condolences to Gwen and families.

Herb Stevens VK3JO

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Below is a recently logged list of intruders into the amateur bands:-

Summary of Illegal Intrusions for April 1993

Freq	Date	UTC	Mode	Remarks	"X"
7002	160493	0540	??	Series of "dahs"	
7002.5	210393	MNI	A1a	"V" Beacon ? RCQ 45	28
7008	2604	1052	F7b		
7039.5	2103	mni	A1a	"F" Beacon/"A"/"K"/"I M'	37
7049	310393	2140	F1B	UHF 3 Data only	3
7049	0604	2130	a1a	5 figure groups CIS	
10115	2304	??	A3C	Wx Fax	
14003	2004	1015	N0N		
14008	130493	1237	MXD	F1 B & N0N	2
14020	0504	1028	A1a	Slow "dit" on a CQ	
14028	1304	1247	N0N		
14034	1404	1155	A3E	2 FOR VOICES NO ID	
14061.5	3003+	mni	mxd	F1b/N0N/F7B/ DATA	29
14062	210393	mni	mxd	F7B,AC3,PON	24
14125>	MNI	mni	mxd	N0N,F1B data	8
14130.5	1404	0620	F1B	DATA	
14135	1204	0535	F1B	140 bd sync	
14140.5	210393	0755+	MXD	UMS F1B,A1A,250 Hz CIS	41
14210	0404	2205	??	140 bds syncro	4
14210	2103	1040	A3E	H2 of 7105 ??	23
14211	0104	1047	F1B	RTTY	4
14217	150493	0600	F1B	RTTY	
14217	2503	1040	mxd	UMS 250 Hz A1A,N0N	10
14279.3	2603	0850	A2a	23 kHz wide	
14284/6	3103+	mni	A1A	VRQ Some sigs 20 kHz wide	15
14338	300493	2230	A3C	Wx Fax	
18075	2904	0813	A3J	Indon b/c stn non amateur	
18100	0304	0542	P0N	O T H R	
18108	2504	0621	F7B		
18135	280493	1100	A3E	B/c stn pips @ 1100,noID	4
21031.5	2103	0045+	mxd	UMS.250 Hz,A1A,F1B,R7B	21
21283.5	2103	0752	mxd	UMS,MNR,F1B,A1A,250 Hz	25
21283.5	1404	1012	F1cw	Moscow Naval Radio [UMS] CIS	
21340	280493	1059	A3E	B/c stn Music v weak	
24894	2804	0651	A3J	? Marine/English/telegrams	
24904	2504	0131	A3E	Asian coastal radio stn	
24937	1404	0948	F1B	RY'S + Piccolo??	
24960	250493	0450	F7B	DAILY,Middle east direction	
24975	1104	0919	A3E	Asian military	4
28515	0104	1044	A3E	B/c stn non amateur	
28400	1304	1103	A3E	B/c stn topic middle east	
29575	1304	1100	A3E	B/c Russian n/amateur CIS	
29640	020493	1019	A3E	B/c stn Chinese	

Logs this month from VK's: 4AGL, 4AKX, 4BTW, 5TL, 6RO and 6XW.

Some more removals, to stress Persistence and Perseverance does pay off.

18161.7 F1b transmission between Paris and Mali, is open again for our use.

18118 Polish Embassy in New DELHI, has been removed, maybe not by our own DOTC intervention, but by the possible information forwarded by R-3 observers.

FCC has further requested the Chinese Authorities to vacate 14056.5 kHz, it being one of the freq used for military marker pulses and data bursts.

Asian fishermen are active in southern area of R-3 on 14018; be on the lookout for them. Military traffic has been reported on 24962 again,thought to be of Asian origin.

Navigation pips heard on 21031.5 are not a "motor boat" but are from UMS, these may be a bit quiet till about September.

Are you aware that 70% of 7-7.1 MHz is *NOT AVAILABLE* to amateurs? It is up to you to report these intrusions, DO NOT sidestep them, if you do, you stand to LOSE THE LOT OF 7MHz. Remember it was once called 40 metres!

This area is seeing an ever increasing number of beacons, between 7002 and

7039.5 to S9, signing V, F, K, IM. 7008 is "hosting" UMS. R7B stations roam between 7.022.5 & 7.030 MHz.

How long are YOU going to tolerate these intrusions? If YOU DO NOTHING, you deserve to be wiped out! It is becoming very obvious to me that most amateurs in VK are willing to give up those frequencies their predecessors fought hard to retain. Where is this "give it a go" now? We in the MS may not always win out every time, but a few words of Abraham Lincoln, may jog you "You may be disappointed if you fail, but you are doomed if you don't try". We try. Are you going to help?

To the states without a co-ordinator, how about becoming an ex-officio for your Division? It is not a hard job, I've got that! Get back to me. In VK4 we have a lady observer, welcome to the Service, June.

The "patrolling" of our bands is essential for our well being, it costs a minimum of 2 hours per week.

From Robin VK7RH [co-ord] comes a snippet: From Hermann, OE1HVB [Austrian co-ord] on harmonics, quote "Radio France International, always said the signal on 14270 is a harmonic of 7135 — until the day when the transmitter on that frequency was in French, and the harmonic was Serbian! Or are we also to believe that harmonics translate into other languages?" end quote. I have also had suspicions along these lines, a further checking procedure may be indicated.

73

FIWC

** WIA Federal Intruder Watch Co-Ordinator*
Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4UN-1

ar

Repeater Link

*Will McGhie VK6UU**

On Air

If you do not have experience in placing a repeater on air, it can be a daunting task. Sometimes even more difficult than your wildest dreams.

Most repeaters are club projects, but usually one or two amateurs end up doing most of the work. From this point on, the work load grows and grows. What follows is some thoughts on how the work load may be made a little easier.

Repeater Sites

Before any construction takes place a repeater site is the number one priority. This can be difficult as prime radio sites are much sought after by many services. Sites tend to fall into two categories. The first is an already established site with power, building and tower. As a guest on the site all efforts must be made to remain welcome. The second type of site is one where everything has to be built from scratch.

If you are faced with building a repeater site from the ground up, then it can be quite a project. One of our repeater sites at Busselton VK6RBN took the best part of a year to build. The remoteness of the site and the large 50 metre (150 feet) tower, together with inexperience, all added up to the long construction time. A decision was made to power the site via a low voltage cable run from a nearby farm house, some two kilometres away. A total of eight kilometres of copper wire was run along the fence line. The system charged a battery at the repeater site but became difficult to maintain. Eventually solar panels were used to power the site and the copper wire power feed disconnected. What seemed like a cheap solution (the copper wire was a donation) turned out to be a liability. Lesson number one; don't cut costs at the expense of long term reliability. The day will come when it will cost you more in time and money.

Lesson number one ... don't cut costs at the expense of long term reliability.

This point is worth making again, because after 20 years of fooling around with repeaters and repeater sites the most important lesson has been, *don't cut corners.* Sure hearing the repeater on air as soon as possible becomes your point to all this effort, and it can sometimes be done with a minimum of money and effort, but chances are you will pay double in the end.

Another point about remote sites that require their own power source. Try to avoid using wind power. Two of our sites in VK6 were powered by wind generators. One a large 30 A generator, and the other a small 4 A unit. Both became a constant source of trouble. Mechanical problems occurred again and again. Solar power is the way to go.

Security

The next problem to be faced with remote sites is security. Just how much effort should be put into making the site vandal proof? Experience in VK6 so far has seen little vandalism. There has been some with coax cables being cut, but to this point we have been lucky. Unfortunately, no matter how secure your site may be, there is always a way of damaging the installation. Perhaps the only type of vandalism that can be guarded against is the opportunistic type. "Just happened to be passing and thought I might smash something." Usually these people are not equipped with the tools to do considerable damage. The dedicated vandal armed with the right tools is hard to stop.

The selection of housing for your repeater at a remote site has many possibilities. The method that has been used in VK6 at a couple of sites is a small tin garden shed. The shed is placed on the cleared site and cement poured in to make a floor and to anchor the shed to the ground. A sun roof is placed on top with a large overhang. Stronger locking is added to the door, and along with a fitted bench, the idea has worked well.

Tower Selection

The type of tower depends on how much height is needed to take best advantage of the site and the type of repeater, duplexed or separate aerials for receive and transmit. It is an advantage to be able to climb the tower safely. Guyed triangular mast sections probably are the easiest to construct. It does mean drilling or digging into rock at most hill top sites. This can be a difficult problem as some equipment is needed to dig out the guy points. If a single aerial is all that is required, then 10 metres of unguyed mast fixed to the repeater building is one way around the problem. Extra attention has to be paid to the structural strength and anchoring of the repeater building in this situation.

When planning your repeater, a decision has to be made early on, as to whether it is to be a duplexed repeater running into one aerial, or separate aerials for the receiver and transmitter. There is no single answer to this. There are advantages and disadvantages to both. Separate aerials for receive and transmit can be cheaper and easier if you have a 30 metre (100') tower. The aerial separation would have to a minimum of 12 metres (40') and preferably 20 metres (60 feet). Even with 20 metres of aerial separation a cavity filter in the receive and one in the transmit coax feed lines would be required. If the normal band pass filter offering an extra 10 dB of isolation is not

enough, then each of the cavity filters can be configured as a notch filter offering 35 dB of isolation.

My choice for ease of operation would be separate antennas as far apart vertically as possible on the mast, combined with a cavity filter in each aerial feed. If you have no experience with cavity filter duplexers, they can be a source of considerable effort to see them up and running. At a latter stage a duplexer can be added.

Antenna Mounting

A good start is for two dipoles to be mounted between an eighth and three eighths of a wavelength out from the tower, one for receive and one for transmit. Don't assume that there is little radiation back through the tower producing poor signals. The signal level is reduced out the back of the tower, but the reduction can be as little as 6 dB. Tests I did on a dipole offset by a quarter wave from a 50 mm (2") pipe showed a front to back ratio of 6 dB. The larger the tower structure the more attenuation, but a figure higher than 10 dB would surprise me. If someone out there has figures on front to back ratios of a dipole mounted off a typical triangular mast, you might let me know so I can pass it on.

One other point about remote sites. Include in your design some form of DTMF remote control. The most important is to be able to turn the repeater transmitter off. All sorts of remote functions can be built in but the most important is to be able to turn the repeater off. Not just in case there is an interference problem, but say the power supply fails causing the battery to go flat. Once the regulators in your repeater design are unable to regulate with the low input voltage, strange things can happen. Things you would prefer not to have on display for long periods of time. A DTMF code can silence the repeater transmitter and prevent the battery from being discharged further. Worth its weight in gold!

Low Voltage Cut Out Switch

One other feature that is worth the trouble to include at remote powered sites, is a low voltage cut out switch to remove the power from the repeater and any other equipment in the event of a power supply problem. It is all peace of mind insurance. If a problem develops, and it probably will, not having to visit the site urgently is to your advantage, believe me. A design for such a low voltage cut out switch was featured in Repeater Link for February 1993.

Equipment Selection

So far the discussion has not mentioned the repeater itself. The choice you make on what equipment to use for your repeater is important. A few years ago, before pagers were on the scene, receiver performance in a strong signal environment was not a big issue. Now it is the most important requirement. What makes a good receiver in this situation is a little hit and miss. All sorts of information can be looked at and discussed at length but you may not have access to this or be able to relate it to your repeater situation.

The tried and true Philips FM 828 has good performance all round. If you want to make the job of putting a repeater on air easier, then this is a good choice. This radio comes in several forms. The standard 25 watt mobile. A 50 watt rack mounted base station, the FM 814, and a radio telephone model FM 880 25 watt, also rack mounted.

There are many other types of radios that would perform as well as the FM 828, but at the moment the FM 828 can be purchased on the disposal market easily. Another advantage is that, being older technology, they are a crystal radio without a computer and synthesizer on board. All useless technology in a single channel repeater. The current consumption is low as well, unlike the newer radios that have a receive drain of up to 1 amp.

The Port Augusta Amateur Radio Club have produced an 18 page booklet on how to convert an FM 828 to amateur repeater service. Included in this manual is a DTMF control board, Morse ident board and many drawings of all the changes and additions. The manual was compiled by Mac VK5AM and may be available from the club. The club's address is PO Box 1337 Stirling North SA 5710. My copy came from Alan VK5BWG who is on Packet @ VK5SU.

Repeater Performance

There is so much that could be written about putting a repeater on air for the first time. The most important is not to cut corners. I know I'm repeating myself, but if none of the previous thoughts are of much use, this one is. If your new repeater ends up on air on the cheap, and its performance and reliability are poor, you will not want to take it off air because amateurs start to rely on it being there. To take it off air and fix all the things you should have done in the first place now becomes difficult. What started out as a *"lets get it on air just for a trial"*, becomes *THE* repeater, and it stays on air operating below the performance you wanted.

If you are a new-time builder and would like more information on building a repeater for the first time, perhaps there are amateurs out there who could help by putting their thoughts on paper so I can pass them on.

Next month's Repeater Link will be a graph and explanation on aerial separation for repeater operation without a duplexer.

** 21 Waterloo Cr Lesmurdie 6076 VK6UU@VK6BBS*

ar

Spotlight On SWLing

*Robin L Harwood VK7RH**

Conditions this midwinter are very good in the daylight hours, particularly on the lower frequencies. Propagation has only been fair, due mainly to the declining sunspot numbers. Frequencies above 17 MHz have not been propagating very well, so I have mainly been monitoring down from the 19 metre allocation and lower. Around 0200 UTC, which is midday locally, I have been noting signals on the 49 meter allocation, especially from European locations. Swiss Radio International and Deutsche Welle are quite audible as is the Spanish National Radio in Madrid.

Signals are coming down the Atlantic Ocean across the tip of South America, before swinging up over the south island of New Zealand and southeastern Australia. There is also a pronounced flutter on the signals. Later on, around 0300, propagation alters to be across central and southern America,resulting in stronger European signals coming in. I realise that many listeners further north in NSW and Queensland do miss out on this rare midwinter phenomenon.

Recently I managed to extract a 83 kilobyte file off the local Packet BBS. It was the complete BBC World Service transmission schedule for the current propagation period until the end of September. My old French master from College days, has been kindly passing on "World Radio", the monthly BBC World Service magazine, which is very useful.

But now, with information off the Packet or on E-mail, I will have access to files such as this one, which is invaluable in assisting me to ascertain the following information: location of the sender, the power employed, the direction or beam

heading, the duration of programming and what language is used. The VOA in Washington has been releasing similar schedules of their information into the Internet system.

I have noted that station KNLS in Anchor Point, Alaska is being heard here at 0800 on 9615 kHz with English religious programs and occasional Japanese announcements. This broadcaster is also heard on 7365 kHz around 1100 in Russian and later in Chinese programming. Signal level on the 31 metre outlet is good, yet there is a heterodyne from an Indonesian station off frequency.

While I am on heterodynes causing problems, I note that the ABC domestic shortwave sender based in Queensland has been having interference from a Latin American broadcaster about half a kilohertz down from 9660 kHz from the local late afternoons well into the evening.

By now, I will hopefully be hooked into the E-mail system, which should allow a faster flow of updated SWL information from other overseas sources. Although I am increasingly getting quite a deal of useful tips off the Packet system, I still rely on what I am able to monitor off-air. Packet radio and hopefully E-mail should give me sufficient advance information to include in this column. I will possibly have the information of how you will be able to reach me via E-mail in a later column.

Meanwhile, I can be reached at the address below or via Packet as follows: VK7RH@VK7BBS.

Until next time, the very best of 73 and good monitoring from Robin L Harwood VK7RH.

* *52 Connaught Crescent, West Launceston TAS 7250*

ar

QSLs from the WIA Collection

*Ken Matchett VK3TL**

Historical Documents Received by the WIA

The Wireless Institute of Australia has been very fortunate in having recently received original QSL cards of two of the most famous names in amateur radio history. These are the Frenchman Leon Deloy 8AB and John I Reinartz 1XAM who, together with F H Schnell 1MO, made the first transatlantic amateur radio QSO on the night of 27 November 1923. It was this single event that opened up the world of DX. It would be true to say that the importance of such documents to the radio historian would be equivalent to a letter from Capt James Cook coming into the hands of a researcher of Australian history.

The generous benefactor is Mr John D Heys G3BDQ of Guestling near Hastings, England. John has a reputation in England as a radio historian and collector of historic documents, in particular QSL cards of the early pre-war period. In addition to the two QSLs referred to, John has contributed more than 100 QSLs of that vintage from almost as many pre-war countries. An historically valuable contribution, indeed. The honorary curator of the WIA Collection, Ken Matchett VK3TL plans to exhibit the QSLs and other documents to as many radio clubs as request it.

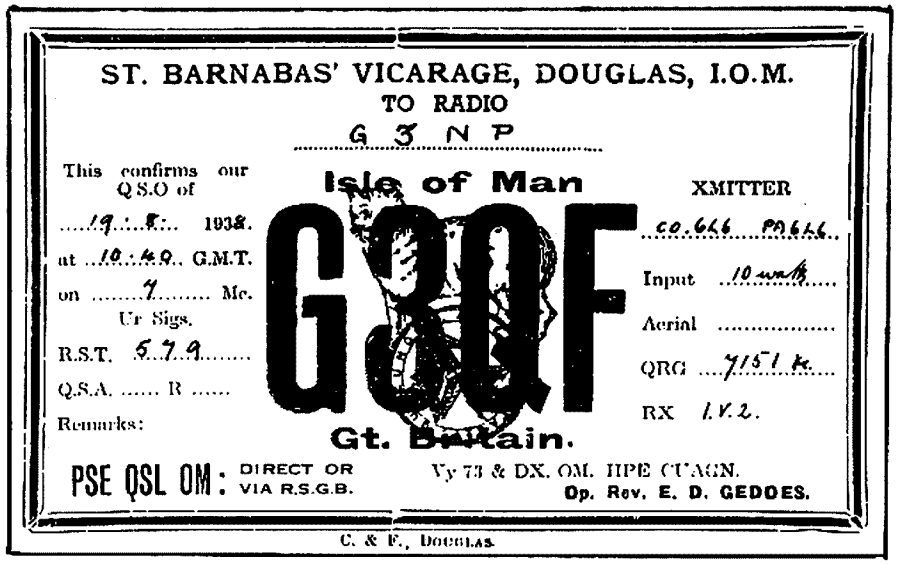
The Isle of Man

Situated in the middle of the Irish Sea, the Isle of Man enjoys a unique geographical position in that it can be seen from England, Scotland, Wales and Ireland. It is a very small island, being approximately 50km long and 16km wide. It would probably be true to say that most people know little about the country and its history, apart perhaps from the fact that everybody has heard of the Manx cat — a tailless creature derived from a genetic mutation. Nowadays the cat is a protected species on the island. (There is even a Government cattery). There seems to be no satisfactory explanation of the name of the island, although many Celtic scholars believe it may be derived from "Mannin", an early tribal name. Technically the Isle of Man is an independent land, being responsible to the reigning monarch rather than to the British Parliament.

Much of the Manx history is associated with that of the Irish mainland. The island had a pre-historic age dating from some thousands of years BC, and an early Christian period about 400-800AD. Saint Patrick is said to have visited the island during this period and, according to legend, banned snakes from the island. The Christian period was followed by the invasion of the island by Norsemen or Vikings, the latter term being derived from the Fjords or Viks abounding along the Scandinavian coastline. The partial return to paganism brought about by the invasion ended with their defeat at the hands of the Scots in the mid-13th century. The gift of the island to Sir John Stanley in 1405 by King Henry IV finally led to stable government.

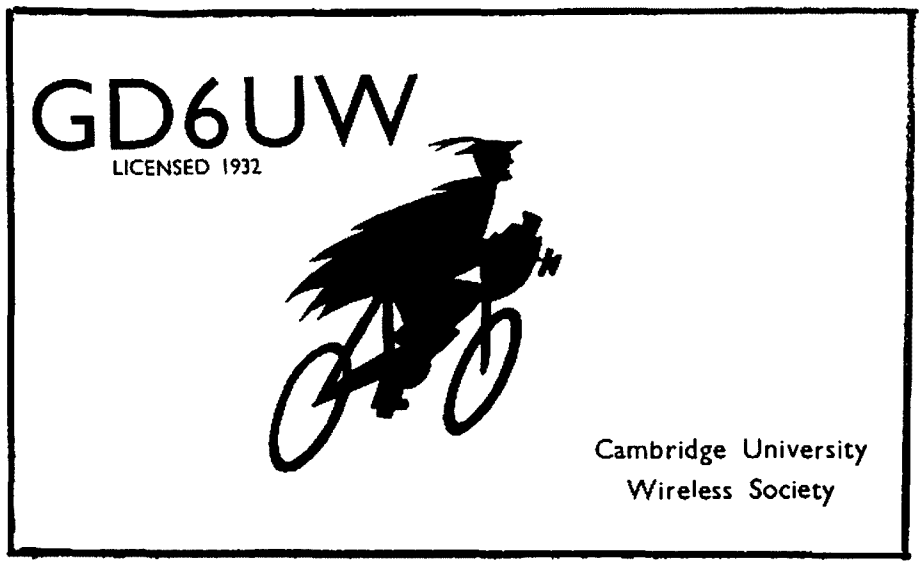
Q3QF

Possibly the earlier amateur calls used in Great Britain were the initials of the operator. In the USA these date back to at least 1903, but there is little known of their use in England. Then followed calls with the letter "G" (Great Britain) in the mid-1920s, and it is quite possible that operation from the Isle of Man took place during this period. Then followed the system of "intermediates" (see AR Nov 1991). The letters EG (E=Europe, G=Great Britain) were used for Great Britain and Northern Ireland as listed in the Radio Amateurs Handbook of 1927. The system of prefixes as we now know them (introduced on 1 January 1929) allocated the letter G to "Great Britain except Ireland". Just before World War II, Scotland was given separate country listing, but with the G prefix, whilst



Northern Ireland received the GI prefix. There was no special allocation to the Isle of Man.

The earliest pre-war QSL from the Isle of Man in the WIA collection is dated 19 August 1938, only a fortnight or so before the outbreak of war. It is from the Rev E Giddes G3QF to an English radio amateur. On G3QF's QSL we read "Isle of Man G3QF Great Britain".



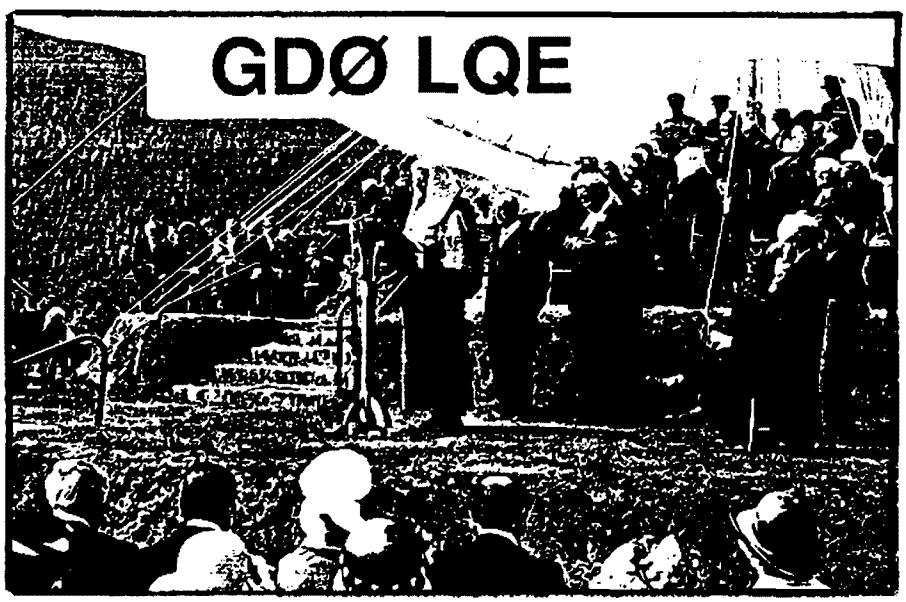
GD6UW

In the ARRL countries list of 1949 we find the GD Isle of Man prefix, but it had been used in 1948. (The collection contains the QSL of GD3UB dated 15 June 1948). Several DXpeditions like GD6UW by the Cambridge University Wireless Society have been conducted to the island especially to cover special events.

GD0LQE

The most famous Manx tradition is undoubtedly the Tynwald assembly. This dates back to the days of the Vikings who conducted open air assemblies in order to proclaim the laws of the land. This tradition is maintained once yearly on 5 July. The accompanying QSL, GD0LQE shows the assembly in 1979. The special prefix GT was used for the first time to celebrate the 1000th year of the parliamentary body, the Tynwald.

The best known sporting event on the island is undoubtedly the TT (Tourist Trophy) Races, a magnet for motorcycle enthusiasts from all over the world. Several Isle of Man radio operators use their QSLs to celebrate (and advertise) the event. As would be expected, tourism plays a most significant role in the island's economy. It is a unique spot, having its own currency and postage stamps, as well as offering excellent facilities for outdoor activities. Both air and ferry services are available from the surrounding mainlands for the prospective tourist.



Author's Note

These series of articles on the history of amateur radio through QSL cards are only possible with the cooperation of the radio amateur fraternity. If you should ever hear of QSL cards being destroyed (for whatever reason) would you draw his or her attention to the need of the collection for such cards? You might like to donate QSLs of your own, especially those you haven't looked at for years. All QSLs are appreciated, and the donation acknowledged both personally and in the columns of AR. Please contact the writer of these articles, who is also the honorary curator of the collection.

Thanks

The WIA would like to thank the following for their kind contribution toward the collection. (Supplementary list):

Percy	VK4CPA
Stephen	VK2PS
Peter	VK2FFA
Bill	VK2XT
Mike	VK6HD

Also, the family and friends of the following Silent Keys (supplementary list):

Geoff Hughes	VK3AUX (courtesy of Milton VK3MN)
Gavin Douglas	VK3YK (courtesy of Moorabbin and District Radio Club)
Ernie Baker	VK2FP (courtesy of Bill VK2XT
Chas Archbold	VK2ARV (courtesy of Bill VK2XT)
Lay Cranch	VK3CF
Alf Goeby	VK4AAG

Errata

In last month's article entitled "The Senior Service — Part 3", it was stated that the ZC4HMS QSL shown celebrated 30 years of the Royal Navy 1960-1990. This should have read "30 years of the Royal Navy Amateur Radio Club 1960-1990".

* *4 Sunrise Hill Road, MONTROSE VIC 3765*
Ph: (03) 728 5350

ar

Contests

*P Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar July-Sept 93

Jul 1	Canada Day CW/SSB	(Jun 93)
Jul 3	Australasian 80m CW Sprint	(Jun 93)
Jul 3	NZART 80m Memorial CW/SSB	(Jun 93)
Jul 3/4	Venezuela SSB DX	(Jun 93)
Jul 10	Australasian Phone Sprint	(Jun 93)
Jul 10/11	IARU HF Championship	(Jun 93)
Jul 10/11	CQ WW VHF WPX Contest	
Jul 11	Jack Files Memorial (SSB)	(Jun 93)
Jul 11	VK6 Annual 80m Contest (SSB)	
Jul 17	Colombian Independence Day	
Jul 17/18	SEANET DX Contest (CW)	
Jul 24/25	Islands On The Air Contest (SSB)	
Jul 24/25	Venezuela CW DX	(Jun 93)
Aug 1	Jack Files Memorial (CW)	(Jun 93)
Aug 1	VK6 Annual 80m Contest (CW)	
Aug 7/8	YO DX Contest	
Aug 14/15	Remembrance Day Contest	
Aug 14/15	Worked All Europe CW	
Aug 14/15	SARTG RTTY Contest	
Aug 14/15	SEANET DX Contest (SSB)	
Sep 4/5	All Asia DX Contest (SSB)	
Sep 4/5	Bulgarian DX Contest	
Sep 11/12	Worked All Europe SSB	
Sep 18/19	SAC DX CW	
Sep 25/26	SAC DX Phone	
Sep 25/26	CQ WW RTTY DX Contest	

In addition to the 5 official contests run by the WIA each year, there are a number of other contests ranging from special interest (eg RTTY) to sprints. This month, this column pays tribute to the organisers of these contests, who invest considerable time, effort, and money (phone calls, postage) to make them enjoyable for YOU. Often, contest administration takes so much time that the organisers miss out on entering their favourite contests themselves. I would like to thank VKs 1PJ, 2BQS, 2SRM, 3KWA, 4LW, 4OR, 5OV, 6NE, 6NK, and ZL1AAS for their efforts in this regard. I would also like to thank the following for their letters, suggestions, and copies of rules, all much appreciated: VKs 2APK, 2BQQ, 2LQ, 2PS, 3DP, 3KPJ, 5AGX, and 8AV. I hope I haven't missed anyone; my apologies if your call isn't listed.

Please keep the letters coming, and especially, any spare copies of rules or results. Until next month, good contesting!

73

Peter VK3APN

Contest Details

The following contest details are supplemented by the "General Rules & Definitions" published in April AR.

CQ WW VHF WPX Contest

July 10/11, 1800z Sat — 2100z Sun

The object of this contest is to work as many amateurs as possible on the 50 MHz band and above using phone or CW. Categories include single operator fixed or portable; multioperator fixed or portable; rover (max 2 oprs, must travel to > 1 prefix or grid square, must sign "rover" or /R). Exchange callsign and Maidenhead grid square (4 digits eg EM15). RS(T) is optional. Non-rover stations may be worked once per band, regardless of mode. Repeaters may not be used for contest QSOs. All QSOs above 300 GHz must use coherent radiation on transmit and employ at least one stage of electronic detection on receive. A station located exactly on a dividing line of a prefix or grid square must choose only one prefix or grid square for exchange purposes, and cannot use another prefix or grid square without moving the complete station at least 100m.

"The organisers miss out on entering their favourite contests themselves."

For each phone QSO, score 1 point on 50/144 MHz, 2 points on 432 MHz, 4 points on 1296 MHz, and 6 points on 2.3 GHz and above. For each CW/MCW QSO, claim an additional point. The multiplier is prefixes plus grid squares per band. Prefixes are as defined for the CQ WPX Contest (refer March 93). (Note: a rover who moves to a new prefix or grid square can count the same prefix or grid square again from the new QTH. QTH changes must be clearly shown in the log. Use separate log for each prefix and/or grid square. Non-rover stations may work a rover, and claim the appropriate points and multiplier/s, each time the rover moves to a new prefix or grid square). Final score = (points on band 1 + points on band 2 + points on band 3 + etc) *x* (prefixes & grid squares on band 1 + prefixes & grid squares on band 2 + prefixes & grid squares on band 3 + etc).

Send logs and summary sheet (standard format) postmarked by 31 August to: Joe Lynch N6CL, VHF WPX Contest, Box 73, Oklahoma City OK 73101, USA. ASCII logs on DOS disk are acceptable providing a hard copy is included. A comprehensive set of awards to the top scoring stations is offered.

Colombian Independence Day

July 17, 0000z — 2400z Sat.

This is a worldwide contest, all bands 80-10m, phone/CW. Categories are single operator, single and all band; multioperator, single and multitransmitter. "Call CQ HK". Exchange RS(T) plus serial number. Score 10 points for QSOs with HK HQ Stations, 5 points for each HK QSO, 3 points for each QSO with stations in another country, and 1 point for each QSO with stations in same country. Multiplier is total countries including HK plus HK call areas worked on each band. "HK" means all other Colombian prefixes as well. Final score is total QSO points from all bands *x* sum of multipliers from each band. At least 2% of QSOs must be with HK, and 10% with stations outside your country. Comprehensive awards include achievement certificates to each station making 100+ QSOs. Send logs postmarked by 31 August to: Liga Colombiana de Radioaficionados, Colombian Independence Day Contest, Apartado 584, Bogota, Colombia.

Islands On The Air Contest (SSB)

July 24/25, 1200z Sat — 1200z Sun

This contest is intended to promote contacts between qualifying IOTA island groups and the rest of the world, and to encourage expeditions to IOTA islands. In these rules "UK" means mainland G, GI, GM and GW only (ie IOTA references EU005 & EU115). Relevant sections are IOTA Island Stations (ie those with an IOTA reference, including GD/GJ/GU), World (excluding UK & IOTA stations); and SWL.

Use 80-10m, SSB only. UK stations may not use 3.5 or 7 MHz between 0800 and 1600z. In accordance with IARU resolutions, please avoid contesting on 3.65-3.70 and 14.3-14.35 MHz.

Exchange RS plus serial number, plus IOTA reference number if applicable. Score 15 points per QSO with an IOTA station (including UK), and 5 points for contacts with stations in another DXCC country. The multiplier is the total IOTA references per band added together. Final score is (total QSO points, all bands) *x* (total multipliers, all bands).

SWLs may only log stations outside their own country, except for new multipliers. Logs should include date/time, callsign of station heard, number sent, number received, callsign of station being worked, multiplier, QSO points. At least two other stations must be heard and logged, or else at least 10 minutes must elapse, before a callsign is repeated in the "station heard" column.

For each band submit a separate log, a list of multipliers, and an alphabetically sorted checklist. Include a summary sheet for the whole contest. Logs on

computer disk are welcomed, in accordance with RSGB format. Send logs airmail to arrive by 31 August to: "RSGB IOTA Contest, c/o S Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England". Certificates will be awarded to the leading stations in each section and continent.

YO DX Contest

August 7/8, 2000z Sat — 1600z Sun.

Here is a good opportunity to catch up on some YO stations, who seem to be largely absent from the bands these days. In this contest everyone can work everyone on SSB and CW. Classes are single operator single/multiband, multioperator. Use 3510-60, 7010-40, 14010-060, 21010-060, 28010-060 (CW); 3700-75, 7040-90, 14150-250, 21200-300, 28400-600 (SSB). Exchange RS(T) plus ITU zone (P2=51, VK4/8=55, VK6=58, VK1/2/3/5/7=59). YOs will send RS(T) plus 2 letter county code. Score 8 points for YO QSOs, 4 points for QSOs outside Oceania, and 2 points for QSOs within Oceania. Final score = (QSO points) *x* (YO counties + ITU zones). Send logs to arrive by 31 August to: RARF, Box 05-50, R-76100 Bucharest, Romania.

Worked All Europe DX Contest

August 14/15 (CW), September 11/12 (SSB), November 13/14 (RTTY); 1200z Sat — 2400z Sun.

The CW section of this popular European contest unfortunately coincides with our RD contest, however with some finesse it is possible to mix the two. The object is to work European stations (except in the RTTY section, where anyone works anyone). Bands are 80-10m. In the contest, avoid 3550-3800 and 14075-14350 for CW, and 3650-3700 and 14300-14350 for SSB. The minimum time of operation on a band is 15 minutes, "although a quick band change to work a new multiplier is allowed" (don't ask me what that means — I'm equally baffled!) Categories are single operator all bands; multioperator single or multi-transmitter (TXs must be within 500m dia area; and SWL all bands. DX cluster support is allowed. Operate 30 hrs max; take up to 3 rest periods (mark them in the log).

Exchange RS(T) plus serial number. Additional points can be gained using QTCs, as follows: After working a number of European stations, details of those QSOs (ie OTCs) can be reported during a current QSO with another European station. In the CW and phone sections, OTCs are sent from non-European stations to European stations. In the RTTY section, QTCs can be sent to any station outside one's own WAC continent. A QTC contains the time, callsign, and QSO number of the station being reported, eg: "1307/DA1AA/431" means you worked DA1AA at 1307z and received serial number 431. Commence QTC traffic by sending the QTC series and number of QSOs to be reported, eg "QTC 3/7" indicates this is the 3rd series and that 7 QTCs will be sent. A QSO may be reported only once, and not back to the originating station. A maximum of 10 QTCs can be sent to the one station, who can be worked more than once to complete the quota. Only the original QSO, however, will have points value.

The multiplier is determined from the number of European countries worked on each band (or on RTTY only, the number of DXCC/WAE countries). On 80m the number of countries is multiplied by 4, on 40m by 3, and on 20/15/10m by 2. The total multiplier is the sum of the individual band multipliers. Final score = (QSOs + QTCs) *x* multiplier.

SWLs log each station only once per band. Logs must contain both callsigns and at least one of the control numbers. Count 1 point for each station logged, and 1 point for each complete QTC received (max 10 per station).

Use standard log and summary sheet format. Include a checklist for more than 100 QSOs on any band, and if more than 100 QTCs have been sent, include another checklist to show that the quota of 10 QTCs per station is not exceeded. Logs can be submitted in ASCII on DOS disk, providing a paper summary sheet is included. Send logs to: WAEDC Contest Committee, Box 1126, D-74370 Sersheim, Fed. Republic of Germany. Deadlines are 15 Sept (CW), 15 Oct (SSB), 15 Dec (RTTY).

European countries are: C3 CT CU DL EA EA6 EI ES F G GD GI GJ GM GM (Shetland) GU GW HA HB HB0 HV I IS IT JW (Bear) JW (Spitzbergen) JX LA LX LY LZ OE OH OH0 OJ0 OK OM ON OY OZ PA S5 SM SP SV SV5 SV9 SY T7 TA1 TF TK UA1346 UA1N UA2 UB UC UO YL YO YU ZA ZB2 1A0 3A 4J1 4K2 4N4 4U (Geneva) 4U (Vienna) 9A 9H.

34th All-Asian DX Contest

June 19/20 (CW), September 4/5 (SSB); 0000 Sat — 2400z Sun

The rules for this contest unfortunately arrived too late for publication before the CW section, which occurred in June. Rather than wait until next month to publish the rules for the SSB section, I have decided to present the rules for both sections this month, so that VKs wishing to submit a log in the CW section can still do so.

The object is to contact as many stations in Asia as possible, on 160-10m (no WARC bands). Classes are single operator, single and multiband; and multioperator multiband. Call "CQ AA" or "CQ Asia". Exchange RS(T) plus two figures denoting your age (YLs send "00"). For each QSO score 3 points on 160m, 2 points on 80m, and 1 point on other bands. The multiplier is the number of different Asian prefixes worked per band, according to CQ WPX rules (refer March 93). Example: JS9ABC/7 counts for prefix JS7. Note that JD1 stations on Ogasawara (Bonin & Volcano) Isl belong to Asia, and JD1 stations on Minamitori Shima (Marcus) Isl belong to Oceania. Final score is (total QSO pts on each band) *x* (total multiplier on each band).

Use standard log and summary sheet format, clearly showing new multipliers when first worked. Send logs postmarked by 30 July (CW) and 30 Sept (SSB) to: "JARL, AA DX Contest, Box 377, Tokyo Central, Japan". Indicate phone or CW on envelope. Awards include certificates to the top 1-5 stations in each country on each band (depending on activity), and medals to the continental leaders. For full results enclose IRC and SAE with log.

Asian prefixes are: A4 A5 A6 A7 A9 AP BV BY EP HL HS HZ JA JD1 (Ogasawara) JT JY OD S2 TA UA9/0 UD UF UG UH UI UJ UL UM VS6 VU (Andaman & Nicobar) VU (Laccadive) XU XW XX9 XZ YA YI YK ZC4 1S (Spratly) 3W/XV 4S 4X/4Z 5B 7O 8Q 9K 9M2 9N 9V; Abu Ail/Jabal at Tair.

* *24 Sovereign Way, Avondale Heights, 3034.*

The 17th West Australian annual 80m CW & SSB Contests Transmitting and Receiving

When: 11 July (SSB), 1 August (CW); 1030-1330z Sunday

The object of this contest is to promote contacts between VK6 and the rest of Australia and overseas, and for SWLs, to hear and log as many VK6 stations as possible.

All contacts must be made in the 80m band using frequencies applicable to your licence. Call "CQ WA", "CQ WAA", or "CQ Contest". Keep CQs brief (3 x 3 max), as excessively long CQs may result in disqualification! Prearranged contacts are not allowed.

VK6 and VK4 stations will send RS(T) plus Shire Code. All others will send RS(T) plus serial number commencing at 001. Stations may be worked twice on the night, ie once during 1030-1300z, and again during 1300-1330z.

VK6 stations should claim 5 pts for each QSO with VK6, 2 pts for VK1/2/3/5/8, 10 pts for VK4, 4 pts for VK7, and 8 pts for VK9/0 & overseas. Stations outside VK6 should claim 3 points per QSO. Multiply the total number of points by 2 per VK6 Shire worked. Note: VK6 stations north of the Tropic of Capricorn may apply a further multiplier of 1.3 to their overall score.

Log sheets should be headed with the date, call, and operator's name, and set out as follows:

TIME Z	CALL WKD	RST OUT	RST IN	SHIRE CODE	SHIRE MULT	POINTS CLAIMED
1045	VK6-	59MV	59	PD	2	5
1105	VK6-	56MV	56	RB	2	5
1110	VK3-	55MV	55001	-	-	2
1120	VK6-	59MV	59	MV	2	5
			TOTALS =		6	17

In this example, the final score is 17 x 6 = 102 pts. If the log belonged to a VK6 station north of the Tropic of Capricorn, the final score would be 17 x 6 x 1.3 = 132.6 pts.

Total columns 6 & 7 at the foot of each page, and attach a summary sheet set out in the standard way (see "General Rules & Definitions", April), including total points scored, TX power, equipment and antennas, and comments on the contest in general. Send your log to: "WAA Contest Committee, 42 Kennedy Street, Melville, WA 6156" to arrive by 3 September for both contests. Results will be published in December AR.

VK6 Shire Codes are as follows:
AT Albany Town; AL Albany; AK Armadale; AM Augusta/Margaret River; BA Bassendean; BW Bayswater; BV Beverley; BO Boddington; BD Boulder; BB Boyup Brook; BG Bridgetown/Greenbushes; BK Brookton; BE Broome; BH Broomehill; BL Belmont; BR Bruce Rock; BY Bunbury; BN Busselton; CA Canning; CL Capel; CH Carnamah; CN Carnarvon; CV Chapman Valley; CI Chittering; CT Claremont; CR Cockburn; CE Collie; CG Coolgardie; CW Coorow; CS Corrigin; CO Cottesloe; CK Cranbrook; CB Cuballing; CU Cue; CD Cunderdin; DU Dalwallinu; DN Dandaragan; DP Dardanup; DK Denmark; DB Donnybrook/Balingup; DR Dowerin; DG Dumbleyung; DS Dundas; EF East Fremantle; EP East Pilbara; ES Esperance; EH Exmouth; FM Fremantle; GG Gingin; GP Gnowangerup; GN Geraldton; GM Goomalling; GS Gosnells; GR Greenough; HC Halls Creek; HY Harvey; IN Irwin; KA Kalamunda; KL Kalgoorlie; KG Katanning; KN Kellerberrin; KT Kent; KP Kojonup; KD Kondinin; KO Koorda; KU Kulin; KW Kwinana; LG Lake Grace; LV Laverton; LA Leonora; MB Mandurah; MP Manjimup; MK Meekatharra; MV Melville; MZ Menzies; MD Merredin; MW Mingenew; MA Moora; MR Morowa; MS Mosman; MU Mukinbudin; ME Mullewa; MG Mundaring; MH Murchison; MY Murray; MM Mt. Magnet; ML Mt. Marshall; NP Nannup; NN Narembeen; NG Narrogin; NT Narrogin Town; NL Nedlands; NM Northam; NO Northam Town; NH Northampton; NG Nungadin; PG Peppermint Grove; PJ Perenjori; PH Perth; PY Pingelly; PT Plantagenet; PD Port Hedland; QG Quairading; RT Ravensthorpe; RM Rockingham; RB Roebourne; SS Sandstone; SJ Serpentine/Jarrahdale; SB Shark Bay; SP South Perth; ST Stirling; SU Subiaco; SW Swan; TP Tambellup; TM Tammin; TS Three Springs; TY Toodyay; TG Trayning; UG Upper Gascoyne; VP Victoria Plains; WN Wagin; WD Wandering; WO Wanneroo; WR Waroona; WA West Arthur; WS Westonia; WP West Pilbara; WI Wickepin; WU Wiluna; WL Williams; WB Wongan/Ballidu; WG Woodanilling; WY Wyalkatchem; WE Wyndham/East Kimberley; WE West Kimberley; YO Yalgoo; YN Yilgarn; YK York

SWL ENTRIES: Rules and scoring are the same as for the Transmitting Section, as applicable. Only actual contacts may be logged, ie it is not permissible to log a station calling CQ. For each station heard, logs should show: Time (z), Station Heard, Station Called, RS(T) Sent, Shire Code, Shire Mult, Pts.

Cliff Waterman VK6NK
WAA Contest Manager

1993 VK/ZL/P2 Remembrance Day Contest

This contest commemorates amateurs who died during WWII, and is designed to encourage friendly participation and help improve the operating skills of participants. It is held annually during the weekend nearest 15 August, the date when hostilities ceased in the south-west Pacific area.

It is preceded by a short opening address by a notable personality, transmitted on various WIA frequencies during the 15 minutes immediately before the contest. During this ceremony, a roll call of those amateurs who paid the Supreme Sacrifice is read.

A perpetual trophy is awarded annually for competition between divisions of the Wireless Institute of Australia. It is inscribed with the names of those Australian amateurs who made the Supreme Sacrifice, to perpetuate their memory throughout amateur radio in Australia.

The name of the winning Division each year is also inscribed on the trophy and, in addition, that Division receives a certificate. The winning Division also holds the trophy for the next 12 months, after it is presented at the Annual Federal Convention.

Objective

Amateurs in each VK call area will endeavour to contact other amateurs in other VK call areas, P2 and ZL on 1.8-30MHz (10, 18 and 24MHz excluded). On 50 MHz and above, amateurs may also contact other amateurs in their own call area.

Contest Period

0800 UTC Saturday 14 August to 0759 UTC Sunday 15 August 1993. Stations are requested, as a mark of respect, to observe 15 minutes silence prior to the commencement of the contest. It is during this period that the opening ceremony is broadcasted.

Rules:

1. The contest categories are:
   (a) High Frequency (HF) — for operation on bands below 50MHz;
   (b) Very High Frequency (VHF) — for operation on the 50MHz band and above.
2. Within each category the applicable sections are:
   (a) Transmitting Phone (AM, FM, SSB, TV);
   (b) Transmitting CW;
   (c) Transmitting Digital (RTTY, AMTOR, PACTOR, packet, etc)
   (d) Receiving (a), (b) or (c).
3. All amateurs in Australia, Papua New Guinea and New Zealand may enter the contest, whether their stations are fixed, portable or mobile.
4. Cross mode operation is permitted. Cross band operation is not permitted.
5. Stations may be contacted once on each band using each mode, ie up to 3 times per band using Phone, CW, and Digital.
6. On the 50MHz band and above, the same station in any call area may be worked using any of the modes listed at intervals of not less than 2 hours since the previous contact on that band and mode.
7. Multi-operator stations are not permitted (except as in Rule 8), although log keepers are allowed. Only the licensed operator may make a contact under his or her own callsign. Should two or more operators wish to operate a particular station, each will be considered as a separate contestant and must submit a log under their own individual callsign.
8. Club stations may be operated by more than one operator, but only one operator may operate at any time, ie no multi-transmission.
9. For a contact to be valid, serial numbers must be exchanged between the stations making the contact. The serial number will comprise 3 figures commencing at 001 for the first contact, and incremented by 1 for each

successive contact. If 999 is reached, the serial number will revert to 001. RS(T) reports are not required.

10. Contacts via repeater (including satellite) are not permitted for scoring purposes. Contacts may be arranged through a repeater. The practice of operating on repeater frequencies in simplex is not permitted.
11. A log of all contest contacts must be kept, and should be in the format shown below.
12. Score 1 point per completed valid contact.
13. A summary sheet for each category entered must be submitted to the RD Contest Coordinator (RDCC) showing the following information: Category (HF or VHF); Section (Phone, CW, Digital, or Receiving); Callsign; Name; Address; Total score. Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest." Signed: Date:
14. Only the summary sheets for each category/section entered should be submitted. DO NOT send the contest log unless requested by the RDCC. The log should be retained by the entrant.
15. Forward the summary sheet/s to: "RD Contest Coordinator, 2 Moss Court, Kingsley, WA 6026". Endorse the envelope "Remembrance Day Contest" on the front outside. Entries must be forwarded in time to reach the RDCC by Friday 10 September.
16. All entrants making 10 contacts or more are eligible for awards. Certificates will be issued according to the Guidelines for Certificate Issue Remembrance Day Contest.
17. The RDCC may, at his discretion, request a log for checking. If your log is requested, ensure it contains the information shown in the example below before sending it.
18. Any station observed as departing from the generally accepted codes of operating ethics may be disqualified.

Determination of Winning Division

Scores of VK0 stations are added to VK7. Scores of VK9 stations are added to the mainland VK call area which is geographically closest. Scores of P2 and ZL stations are not included in those of any VK call area, but are considered separately. The scores of entrants located outside their allocated call area will be credited to the call area in which they operate, ie the score of VK5XY/2 will be credited to that of the VK2 Division.

The formula applied to determine the winning WIA Division is: (Total Contacts per Division)/(Total Licences per Division) x (Weighting Factor). The Weighting Factors are calculated such that if each WIA Division were to perform as well in 1993 as during the preceding 4 years (averaged), the result would be a 7 way dead-heat. Consequently, the most improved Division will win the trophy, and also earn a revised and lower weighting factor for the following year.

Receiving Section Rules

1. This section is open to all SWLs in Australia, Papua New Guinea, and New Zealand. No active transmitting station may enter this section.
2. Rules are the same as for the Transmitting Section, as applicable.
3. Only completed contacts may be logged, ie it is not permissible to log a station calling CQ. The details shown in the example must be recorded.
4. The log should be in the format shown below.

Example Front Sheet

Remembrance Day Contest 1993
Category: HF
Section: Transmitting phone
Callsign: VK1XXX
Name: Joe Brown
Address: PO Box 123, Farm Orchard, ACT 2611
Total Score: 105
Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest.
Signed: J Brown Date: 20.8.93

Example Transmitting Log

Remembrance Day Contest 1993
Callsign: VK1XXX
Category: HF
Section: Transmitting phone

Date Time (UTC)	Band (MHz)	Mode	Call Snt	No Rcd	No	Pts
0800	14	SSB	VK2QQ	001	002	1
0802	14	SSB	VK6LL	002	001	1
0805	14	SSB	VK5ANW	003	011	1
0807	14	SSB	ZL2AGQ	004	003	1
0809	14	SSB	VK4XX	005	007	1

Example Receiving Log

Remembrance Day Contest 1993
Name/SWL No: L30371
Category: HF
Section: Receiving phone

Date Time (UTC)	Band (MHz)	Mode	Calling	Called	No Snt	No Rcd	Pts
0800	14	SSB	VK1XXX	VK2QQ	001	002	1
0802	14	SSB	VK1XXX	VK6LL	002	001	1
0805	14	SSB	VK5ANW	VK1XXX	011	003	1
0807	14	SSB	ZL2AGQ	VK1XXX	003	004	1
0809	14	SSB	VK7AL	VK2PS	007	010	1

Neil Penfold VK6NE
RD Contest Coordinator
ar

WICEN

News from WICEN (NSW) Inc

The Annual Coordinators Conference held in May was a success; a lot of emphasis being placed on electronic communications such as bulletin board systems (BBSs), and the USENET newsgroup "aus.radio.wicen" that is gatewayed into the FidoNet WICEN conference. We thank the people who attended, especially those who had far to travel. The next Coordinators Conference will be hosted by Greg Wilson VK2DIL in the Northern Rivers area around August or September.

As a result of assistance from VK3 WICEN, VK2 now has its own telephone BBS, which is linked into the ADMIN national disaster network. Information was sketchy at the time of writing, but full details will be released when the system is operational.

The weekly HF net appears to have been inactive for several months; as this can only raise the spectre of the hoary "City vs Country" argument, the committee would like to hear from anyone who is interested in running it again.

A calendar for the next few weeks follows, with the contact name given in brackets:

WICEN (NSW) AGM	10 Jul
Rescue Expo 93 (Alan VK2YYJ)	16-18 Jul
WICEN Sydney South meeting	20 Jul
Kempsey/Timor Cave Rescue (Cave Rescue Squad)	24-25 Jul
Sutherland to Surf Fun Run (Kevin VK2CKD)	25 Jul
Yango Ride (John VK2GJB)	31 Jul-1 Aug
City to Surf Fun Run (Brett VK2XMU)	8 Aug
Batemans Bay Car Rally (Dave VK2BDJ)	14-15 Aug

It would be appreciated if all regions would submit publicity material in time for the weekly WIA broadcast, and to inform the executive committee of their activities, otherwise your actions will go unnoticed.

All WICEN personnel are reminded that the only postal contact with WICEN (NSW) Inc is PO Box 123, St Leonards 2065; all other addresses are null and void. WICEN (NSW) conducts nets at various times; the only one we know about is the Sydney VHF Net every Thursday night at 2130 local time on repeater 7150 in Chatswood.

Dave Horsfall VK2KFU
Publicity Officer
WICEN (NSW) Inc
ar

Over to You — Member's Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Presumptuous Pirates

I am aware of a number of incidents where legitimate amateurs have been asked to vacate a frequency that is required for use by /MM amateurs, only to find that the amateur frequency has been vacated for a "pirate" station. The most recent incident of this was on 23.5.1993 when a NZ reciprocal licensee, using his VK4 callsign and located in Townsville, was in QSO with a NZ "non-licensed pirate" and exchanging illegal third-party traffic.

For a period of three minutes the frequency was unoccupied whilst the NZ unlicensed operator made an illegal third-party traffic phone call for his VK4 friend. During this period of silence, several legitimate amateurs attempted to use the frequency and were promptly told the frequency is in use, please QSY. They were not told that the frequency was in use by a pirate involved in illegal third-party traffic. The NZ station was involved in passing third-party traffic from the Suzuki Jeep agent, JJ's in Gore. This unlicensed operator is a regular on the 20m maritime mobile nets that operate at the top end of the 20m band, and is known to be unlicensed by the net controllers and net participants.

It is outrageous that the misuse of amateur radio has become so blatant that genuine amateurs involved in legitimate amateur activities are told to make way for illegal pirate traffic.

I am also aware that one NSW amateur, aware of my protests on these types of activities, has stated he will organise the yachties to get me stopped and have me silenced. I am not intimidated, and will not cease my protests. If anyone doubts the veracity of these statements, I hold audio tapes that clearly confirm my comments.

Thinking amateurs should stand up and be counted, and no longer tolerate the prostitution of amateur radio by this small group of parasites on our bands.

Deane Laws VK4ALN
27 Awoonga Av
Burleigh Heads QLD 4220

Morse Stories

The TV show "Inspector Morse" is on Channel 7 each Monday night. The musical background is very tastefully handled, and I enjoy the series very much. I wonder how many hams read the morse letters spelling out "Morse", cleverly disguised in the concluding musical background to the credits.

This reminds me of a beautiful story, which I may have read in AR a long time ago, or perhaps in some other journal. My telling of it will not compare with the original, but it goes like this: The American telegraph company, Western Union, had advertised for a telegrapher (American for telegraphist) during the Depression. Applicants were invited to call at their central telegraph office for interview. They duly arrived, and were asked to sit in the large hallway adjacent to the noisy telegraph office. Many old friendships were renewed at that gathering. At one stage, one of the applicants got up from his chair and left the room. He returned again after a few minutes, and announced he had been given the job. One of the others asked how this had happened.

"Didn't you hear it?" he asked. "One of the sounders was asking any interested applicant to go to room 3."

Bob Slutzkin VK3SK
8 Lynedoch Av
Balaclava 3183

Origin of "Ham"

I wept crocodile tears (once again) as I read the heart-rending story of that brave little amateur station Hy-Al-Mu and its struggle for survival against the mighty forces of the US Wireless Regulations Bill, as published in AR for May 1993. This appears to be no more than just a fanciful story. Its origins evidently go back much further than "Florida Skip" of 1959, and it appears earlier to have been "doctored" (with slight variations) in the New York doctors' medical bulletin in 1947. Indeed, its provenance may even recede further into antiquity.

I enclose for your information copies of articles on this subject from the successive spring and summer 1991 issues of "Handi-Ham World", the newsletter published by Courage Handi-Ham System of Courage Center, 3915 Golden Valley Road, Golden Valley, Minnesota, USA 55422. No doubt there are even more versions of the origin of the term "ham", and it would be entertaining to hear them.

Laurie Walters VK3DPD
523 Glenferrie Rd
Hawthorn 3122

(Editor's note: Laurie submitted several items, too detailed to publish here, in which an ARRL spokesman quoted the Harvard Wireless Club, the Congressional Record and Senator Walsh, all to the effect that Dr Hyman's story is a "figment of his imagination" ... VK3ABP).

A Tip for CW Operators

The following came from Bill Heinrich VK5HR, a former wartime signals officer in the RAAF:

At one time, in the tropics where QRN was a real problem, one of his operators found it was easier to read CW signals (and also exclude the QRN) by placing the headset on his cheekbones instead of the normal position over the ears.

Bill thinks perhaps this was a case of "bone conduction" (to the exclusion of QRN). A sort of unexpected QRN filter.

Bill says that in the air, say at 10,000 feet, there was less QRN than on the ground, where this method was effective.

He gives credit for the idea to a man who had no previous telegraphy experience before joining the RAAF.

I have not tried this idea myself, but am waiting for a suitably "difficult" occasion to arise.

Tom Laidler VK5TL
18 Albion Av
Glandore 5037

Commodore 64 Controlled Sending and Contesting

If you still own a Commodore 64 computer, don't throw it away. You can make it really work for you.

Use it for CW QSO sending, contest logging, dupe checking and much more.

With the greater availability of cheap Commodore 64 computers in recent years, keyboard sending and contesting are at your fingertips.

If you have not tried yet, you are missing out on a really interesting and enjoyable amateur radio communication.

Software programs and simple "key to TX interface" schematics are available free of charge from the writer. Send diskette, postage and packaging.

Karol Nad VK2BQQ
GPO Box 3209
Sydney NSW 2001
Ph: (02) 957 6808
ar

Stolen Equipment

Southern Peninsula Amateur Radio Club

The SPARC club rooms have been broken into twice in recent months. The first time a 25 A PSU and YAESU FT400 transceiver was stolen. On 16th June 1993, a KENWOOD TS520S HF transceiver, Serial No. 560762 was stolen. Enquiries to Max Morris VK3YBE (059) 85 2671, or the local police.

ar

Education Notes

*Brenda M Edmonds VK3KT**

From time to time I receive letters either commenting on statements I have made in this column or offering opinions on examinations and syllabus matters. Let me remind readers that "the views expressed are not necessarily those of the management". It is my experience that the most effective way to stimulate a response is to propose some major change in the status quo, or offer a wildly different interpretation of a commonly accepted document or policy.

The WIA is always pleased to receive comments from members (and non-members) on policy establishment and implementation. This is especially so in the examinations/education field. It is now some years since I was actively involved in running classes for intending amateurs, and I am quite sure that I am starting to get out of touch with the student population. I know that the syllabuses need revision — they were last revised in 1984 — and I have mentioned that many times. Have the entry levels of the students changed in that time, or have community/hobby standards changed to make parts of the syllabus no longer relevant?

We accept that there has been a considerable amount of technical development in the last 10 years, but how much of that development should be applied to the incoming recruits? A good illustration is the current AOCP/AOLCP syllabus Section 14, which covers the "Advanced Modes". It lists:

high definition television (ATV)
slow scan television (SSTV)
radio teletype (RTTY)
repeaters (FM and ATV)
satellite translators and transponders
beacons
techniques involving bandwidth compression (eg narrow band voice modulation)
computer controlled systems (AMTOR, packet radio etc).

Two questions per examination paper are to be taken from this section. Are all of the above modes of equal importance to the student or in the overall profile of the hobby? Perhaps if knowledge of these modes is important to the student, it is also important to those of us who were examined before any of these techniques were in use. How about an "Upgrading" examination before any of the oldtimers are permitted to operate on any of these modes?

If, as proposed, Novices are to be permitted to use data modes, this must be reflected in the Novice syllabus, and suitable questions included in the examinations. I would be very pleased to receive any such questions from members for possible use in the question banks.

The big question, though, is what do we leave out to make room for all the new material to be included? Or do we go on expecting each generation of new amateurs to cope with an ever increasing body of knowledge? Let us not discourage potential amateurs by giving them mental indigestion before they begin.

* *WIA Federal Education Co-ordinator*
PO Box 445 Blackburn VIC 3130

ar

Golden Days of Radio

Arthur J Brown VK2IK 33 Gloucester Rd, Epping 2121

Coinciding with Australia Post's four-stamp issue celebrating "the golden days of radio" on 13 June 1991, the display (at right) was set up in Epping Post Office NSW 2121. The display attracted a lot of interest, especially with the local schoolchildren. The post office officials asked for the display to remain longer than had been intended.

The articles on display, from left to right, are:

1. Pocket book, spider web coils, broadcast crystal set and phones, circa 1930.
2. Reis carbon microphone, built in 1934 for use on amateur station VK2IK. Commercially made mikes of this era were used on BC stations.
3. Working "Reinartz" radio of the late 1920s. Restored from original cabinet, Philips valves (A425, A409, B406), Ideal transformers and Amplion horn speaker. A few parts of the 1960s to eliminate the A, B and C batteries.
4. A couple of vintage valves of the '30s and '20s. Left: Philips PH280; right: Western Electric 4101DL, pip-type triode (intact filament).

Display in Epping NSW Post Office 12-19 June 1991. Old radio and Amateur Radio apparatus of the 1920 — 1930 period.

5. Home brew morse key, circa 1933. Made for morse practice and later use on amateur radio station VK2IK.
6. Experimental condenser microphones. Built in 1934 and used on AR station VK2IK until 1938.

ar

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used for these calculations is 63.3, while the predicted value for August is 60.8 and for September it is 57.8.

ar

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.7	8	6.9	-3	-26	...	...	...
2	7.9	-1	6.1	-4	-25	...	...	...
3	7.9	-8	6.1	-4	-22	...	...	...
4	10.8	-1	8.4	1	-7	-19	-39	...
5	15.7	4	12.2	2	3	-2	-12	-26
6	18.6	4	14.3	2	5	1	-6	-16
7	17.7	4	13.3	2	4	0	-8	-19
8	15.8	5	11.9	4	3	-3	-14	-28
9	13.7	4	10.2	4	0	-9	-24	...
10	11.6	4	8.7	4	-6	-18	-38	...
11	10.0	4	7.5	1	-13	-30	...	...
12	9.0	7	6.7	-1	-21	...	...	...
13	8.5	13	6.3	-3	-28	...	...	...
14	6.2	21	6.1	-5	-35	...	...	...
15	8.2	26	6.0	-5	-37	...	...	...
16	8.2	28	6.1	-5	-38	...	...	...
17	8.2	30	6.2	-7	...	...	...	...
18	7.9	31	6.0	-9	...	...	...	...
19	7.5	31	5.7	-13	...	...	...	...
20	7.6	31	5.9	-11	...	...	...	...
21	7.9	31	6.0	-10	...	...	...	...
22	7.6	30	5.9	-13	...	...	...	...
23	7.2	21	5.8	-15	...	...	...	...
24	7.4	11	5.8	-12	...	...	...	...

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	15	10.1	15	10	3	-8	-22
2	14.1	16	9.6	16	10	1	-12	-28
3	13.3	19	9.1	17	8	-2	-17	-35
4	12.7	25	8.7	21	8	-5	-23	...
5	12.7	23	8.8	19	7	-5	-22	...
6	13.5	24	9.4	22	11	0	-17	-35
7	14.5	20	10.7	20	9	-2	-19	-38
8	12.3	15	9.2	12	0	-13	-32	...
9	10.5	6	7.8	5	-7	-20	...	...
10	9.5	-4	7.0	1	-9	-22	...	...
11	8.9	-13	6.6	0	-8	-21	-39	...
12	8.6	-23	6.3	-2	-9	-21	-39	...
13	8.6	...	6.4	-12	-18	-30	...	...
14	8.6	...	6.3	-19	-24	-35	...	...
15	8.6	...	6.4	-24	-27	-37	...	...
16	8.3	...	6.2	-31	-35	...	...	...
17	7.8	...	5.9	-39	...	...	...	...
18	7.9	...	6.1	-34	-39	...	...	...
19	9.6	-39	7.0	-13	-14	-22	-36	...
20	12.7	-8	9.8	-4	-1	-6	-15	-28
21	16.0	1	12.2	-2	2	-1	-8	-18
22	17.5	7	12.0	5	7	4	-2	-11
23	16.6	12	11.4	11	11	6	-2	-12
24	15.8	13	10.7	13	11	5	-4	-16

VK EAST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.9	24	18.0	33	32	28	22	13
2	23.8	24	17.9	33	32	28	21	13
3	23.7	24	17.8	35	33	29	22	13
4	23.3	25	17.6	37	34	29	21	12
5	22.1	27	16.7	40	35	29	20	9
6	20.2	30	15.3	44	36	27	16	3
7	17.9	33	13.5	42	32	22	7	-7
8	15.7	35	11.8	39	26	14	-3	-20
9	13.8	37	10.4	35	19	4	-14	-36
10	12.5	39	9.4	32	13	-3	-25	...
11	11.7	39	8.8	29	8	-8	-32	...
12	11.1	40	8.3	26	4	-14	...	...
13	10.6	41	7.9	23	1	-18	...	...
14	10.3	41	7.7	22	0	-21	...	...
15	10.3	41	7.7	22	-1	-22	...	...
16	9.5	42	7.2	17	-7	-30	...	...
17	8.3	43	6.4	9	-20	...	...	...
18	8.4	43	6.5	9	-19	...	...	...
19	11.1	39	8.6	25	5	-14	-39	...
20	15.8	31	12.2	35	24	13	-2	-19
21	19.9	27	15.3	36	31	24	13	1
22	22.3	25	17.1	35	32	27	19	9
23	23.2	24	17.6	34	32	28	20	11
24	23.6	24	17.9	33	32	28	21	12

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.6	10	17.2	10	14	12	6	-1
2	22.6	10	17.6	9	14	12	6	-1
3	22.6	10	17.2	9	13	12	6	-2
4	22.8	10	17.4	9	14	12	7	-1
5	22.9	11	17.5	11	15	13	7	0
6	22.2	12	17.0	14	16	13	6	-2
7	20.8	13	15.9	18	17	12	3	-7
8	19.0	16	14.4	24	18	10	-2	-17
9	17.2	19	13.2	28	16	5	-12	-30
10	15.4	22	11.8	26	11	-4	-25	...
11	14.3	23	10.9	23	5	-12	-37	...
12	13.5	24	10.3	21	0	-19	...	...
13	12.8	25	9.7	18	-5	-27	...	...
14	12.1	25	9.3	14	-11	-35	...	...
15	11.5	26	8.7	10	-17	...	...	...
16	11.2	26	8.6	8	-20	...	...	...
17	10.1	27	7.7	-1	-35	...	...	...
18	8.4	28	6.5	-20	...	...	...	...
19	8.3	28	6.4	-22	...	...	...	...
20	11.0	27	8.5	9	-18	...	...	...
21	14.8	21	11.5	23	8	-6	-26	...
22	20.8	14	16.1	22	19	13	4	-7
23	22.6	13	17.3	17	18	15	8	-1
24	22.7	11	17.4	13	16	13	7	-1

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.0	5	10.6	5	4	-2	-14	-28
2	14.3	-1	10.7	-1	1	-2	-11	-23
3	17.3	1	12.9	-7	1	1	-3	-11
4	21.1	4	16.0	-12	1	4	2	-2
5	22.7	3	17.2	-15	0	3	2	-2
6	22.3	2	16.9	-15	0	2	1	-3
7	21.2	2	16.1	-13	0	2	0	-5
8	19.4	2	14.7	-8	1	2	-2	-9
9	17.2	2	13.0	-3	2	0	-6	-16
10	15.1	2	11.5	1	2	-3	-13	-26
11	13.3	3	10.1	4	0	-8	-23	...
12	12.1	5	9.1	5	-3	-14	-32	...
13	11.4	10	8.6	7	-5	-20	...	...
14	10.9	15	8.2	8	-9	-27	...	...
15	10.5	22	8.0	8	-13	-34	...	...
16	10.3	25	7.7	8	-15	-39	...	...
17	10.2	27	7.7	8	-16	...	...	...
18	9.5	29	7.2	4	-24	...	...	...
19	6.4	30	6.4	-5	...	...	...	...
20	8.4	30	6.5	-5	-39	...	...	...
21	11.0	28	8.2	13	-10	-32	...	...
22	12.8	26	9.8	22	6	-9	-31	...
23	12.0	18	9.2	14	0	-14	-35	...
24	15.3	13	11.7	14	10	3	-9	-23

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	16.1	21.2	24.9	28.5
1	22.9	5	17.3	-7	4	6	3	-2
2	22.8	7	17.2	0	8	8	5	-1
3	21.7	12	17.2	10	14	12	7	0
4	20.1	17	16.1	20	19	15	7	-2
5	19.2	21	15.3	29	23	17	7	-4
6	18.5	23	14.6	32	24	16	4	-9
7	17.7	22	13.5	31	20	10	-4	-21
8	15.7	24	11.9	28	15	2	-16	-36
9	13.9	26	10.5	24	8	-8	-30	...
10	12.7	27	9.6	20	1	-17	...	...
11	11.9	27	9.0	17	-3	-23	...	...
12	11.3	28	8.4	14	-8	-30	...	...
13	10.7	26	8.0	11	-12	-35	...	...
14	10.4	18	7.8	6	-14	-34	...	...
15	10.2	11	7.8	4	-13	-32	...	...
16	9.4	0	7.2	0	-16	-33	...	...
17	8.1	-13	6.2	-4	-19	-37	...	...
18	8.1	-20	6.3	-3	-15	-31	...	...
19	10.9	-11	8.5	-2	-6	-15	-31	...
20	15.6	-2	12.1	-6	-1	-3	-11	-22
21	19.6	1	15.1	-10	0	1	-2	-9
22	21.8	2	16.7	-13	0	2	0	-5
23	22.4	3	17.1	-13	0	3	1	-3
24	22.7	3	17.2	-11	1	4	2	-3

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.4	19	6.4	-3	-30	...	...	...
2	8.4	12	6.5	-3	-27	...	...	...
3	11.3	12	8.4	8	-6	-21	...	...
4	16.3	12	12.6	13	9	1	-11	-27
5	18.5	8	14.9	9	9	4	-5	-17
6	19.5	7	15.7	7	8	5	-3	-13
7	18.8	7	15.0	6	7	3	-5	-16
8	17.4	7	13.8	7	6	1	-9	-22
9	15.5	7	12.3	8	4	-4	-17	-33
10	13.4	7	10.5	7	-1	-12	-29	...
11	11.5	8	9.0	5	-8	-23	...	...
12	9.9	9	7.7	1	-18	-38	...	...
13	8.9	13	6.9	-3	-27	...	...	...
14	8.4	20	6.4	-7	-38	...	...	...
15	8.2	25	6.3	-8	...	...	...	...
16	8.1	27	6.2	-9	...	...	...	...
17	8.1	29	6.2	-10	...	...	...	...
18	8.0	30	6.2	-11	...	...	...	...
19	7.7	30	6.0	-14	...	...	...	...
20	7.4	30	5.8	-17	...	...	...	...
21	7.7	30	6.1	-14	...	...	...	...
22	8.0	30	6.2	-9	...	...	...	...
23	7.6	30	6.0	-13	...	...	...	...
24	7.9	24	8.2	-10	...	...	...	...

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.8	8	14.3	7	8	4	-4	-16
2	19.3	7	14.6	5	8	5	-2	-13
3	19.7	7	14.8	5	8	5	-1	-12
4	19.6	7	14.8	5	8	5	-2	-12
5	19.4	8	14.6	7	9	6	-2	-13
6	18.8	9	14.2	9	9	5	-4	-16
7	17.6	10	13.3	12	9	2	-9	-23
8	15.8	13	11.9	15	7	-3	-20	-39
9	13.7	18	10.4	16	0	-17	...	...
10	11.8	21	8.9	9	-15	-39	...	...
11	10.2	22	7.7	-2	-35	...	...	...
12	9.2	24	6.9	-13	...	...	...	...
13	8.7	25	6.5	-20	...	...	...	...
14	8.4	26	6.2	-25	...	...	...	...
15	8.2	26	6.1	-27	...	...	...	...
16	8.3	26	6.2	-27	...	...	...	...
17	8.3	26	6.3	-26	...	...	...	...
18	7.9	26	6.0	-33	...	...	...	...
19	7.3	26	5.6	...	...	...	...	...
20	7.4	26	5.7	...	...	...	...	...
21	9.3	25	7.2	-12	...	...	...	...
22	12.8	11	9.7	7	-8	-25	...	...
23	15.7	9	12.1	10	4	-4	-19	-37
24	17.8	8	13.6	9	8	2	-8	-21

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.1	12	9.7	12	7	0	-12	-27
2	13.3	16	9.2	15	7	-3	-18	-35
3	12.6	19	8.8	16	5	-6	-24	...
4	12.1	24	8.6	19	4	-10	-30	...
5	12.2	23	8.7	18	4	-9	-29	...
6	13.0	23	9.3	20	8	-4	-22	...
7	13.6	19	10.4	18	5	-8	-27	...
8	11.6	14	9.1	9	-4	-19	...	...
9	10.0	7	7.8	3	-12	-28	...	...
10	9.0	-2	7.0	0	-14	-31	...	...
11	8.5	-10	6.5	-1	-13	-29	...	...
12	8.2	-20	6.3	-3	-14	-28	...	...
13	8.2	...	6.4	-14	-24	-39	...	...
14	8.1	...	6.2	-25	-33	...	...	...
15	8.1	...	6.3	-33	...	...	...	...
16	7.8	...	6.1	...	...	...	...	...
17	7.4	...	5.6	...	...	...	...	...
18	7.7	...	6.0	...	...	...	...	...
19	9.0	...	6.8	-35	-36	...	...	...
20	11.4	-22	9.1	-9	-7	-11	-22	-36
21	14.1	-7	11.3	-7	-1	-4	-11	-22
22	16.4	-1	11.6	-6	0	-1	-7	-16
23	15.7	2	11.0	0	4	1	-5	-15
24	14.8	7	10.3	7	6	1	-8	-20

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.9	12	10.6	12	6	-3	-17	-34
2	14.1	4	10.6	4	3	-3	-14	-29
3	17.2	3	13.5	-2	4	2	-4	-13
4	21.3	4	16.1	-8	3	4	2	-3
5	21.9	3	16.4	-11	1	3	1	-4
6	21.7	2	16.3	-12	0	2	0	-4
7	20.9	2	15.7	-12	0	2	0	-6
8	19.4	2	14.5	-8	1	1	-2	-10
9	17.3	1	13.0	-4	1	0	-7	-17
10	14.8	0	11.1	0	0	-4	-15	-28
11	12.6	0	9.4	1	-2	-12	-27	...
12	10.8	1	8.1	2	-9	-23	...	...
13	9.8	5	7.3	0	-16	-35	...	...
14	9.2	12	6.8	-1	-24	...	...	...
15	8.9	20	6.6	-3	-31	...	...	...
16	8.8	24	6.5	-3	-34	...	...	...
17	8.9	27	6.6	-3	-34	...	...	...
18	9.0	29	6.7	-2	-34	...	...	...
19	8.7	29	6.5	-5	-39	...	...	...
20	8.1	29	6.2	-11	...	...	...	...
21	8.3	29	6.4	-9	...	...	...	...
22	10.1	28	7.8	6	-21	...	...	...
23	10.3	26	8.0	9	-14	-37	...	...
24	14.1	19	10.6	19	7	-5	-23	...

VK SOUTH SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.4	13	13.1	19	12	2	-13	-30
2	17.8	14	13.3	19	13	3	-11	-28
3	17.8	14	13.3	21	13	4	-11	-28
4	17.6	15	13.2	22	14	4	-11	-29
5	16.5	18	12.5	24	13	0	-17	-38
6	14.7	23	11.1	25	7	-9	-32	...
7	13.0	26	9.8	20	-2	-23	...	...
8	11.3	28	8.5	12	-15	...	...	...
9	9.8	30	7.4	1	-32	...	...	...
10	8.9	31	6.7	-8	...	...	...	...
11	8.1	32	6.0	-18	...	...	...	...
12	7.6	33	5.7	-25	...	...	...	...
13	7.4	33	5.5	-29	...	...	...	...
14	7.3	33	5.4	-30	...	...	...	...
15	7.4	33	5.5	-29	...	...	...	...
16	6.8	35	5.2	-36	...	...	...	...
17	6.8	34	5.3	-37	...	...	...	...
18	6.7	34	5.1	...	...	...	...	...
19	6.8	32	5.3	-38	...	...	...	...
20	8.2	23	6.4	-15	...	...	...	...
21	10.9	18	8.4	5	-19	...	...	...
22	13.5	15	10.4	13	-1	-17	...	...
23	15.5	14	11.9	16	6	-5	-24	...
24	16.7	13	12.7	18	10	0	-16	-35

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.5	6	17.4	-5	5	6	4	-2
2	22.5	9	16.8	4	10	10	5	-1
3	22.2	12	16.6	14	16	14	7	0
4	21.3	16	16.0	24	21	16	7	-2
5	19.9	19	14.9	30	23	15	4	-8
6	17.8	21	13.3	30	20	10	-3	-19
7	15.3	23	11.4	27	13	0	-18	-38
8	13.0	26	9.7	21	3	-14	-38	...
9	11.1	28	8.3	13	-9	-31	...	...
10	10.0	29	7.4	7	-20	...	...	...
11	9.4	29	7.0	3	-26	...	...	...
12	9.1	29	6.7	0	-31	...	...	...
13	9.0	27	6.7	0	-30	...	...	...
14	9.1	17	6.7	0	-25	...	...	...
15	9.2	8	6.8	0	-20	...	...	...
16	8.8	-2	6.6	-2	-19	-38	...	...
17	8.2	-12	6.2	-3	-18	-36	...	...
18	8.4	-17	6.4	-2	-14	-29	...	...
19	10.3	-12	7.5	-1	-7	-17	-34	...
20	13.8	-5	10.6	-4	-1	-6	-16	-30
21	17.3	0	13.2	-7	0	0	-6	-15
22	19.8	1	15.1	-11	0	1	-1	-8
23	21.2	3	16.0	-11	1	3	0	-5
24	22.1	4	16.6	-9	2	4	2	-3

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	7.9	24	6.1	-9	...	...	...	...
2	8.0	15	6.2	-6	-35	...	...	...
3	11.0	12	8.2	7	-8	-25	...	...
4	16.1	11	12.5	13	8	0	-13	-29
5	19.1	8	14.5	9	10	5	-4	-16
6	20.2	7	15.2	7	9	6	-1	-12
7	20.1	6	15.0	5	8	5	-2	-12
8	19.3	6	14.5	5	7	4	-4	-15
9	17.9	6	13.4	6	6	1	-8	-21
10	16.0	7	12.0	8	4	-3	-15	-31
11	13.8	9	10.3	8	0	-10	-28	...
12	11.7	11	8.8	7	-7	-22	...	...
13	10.1	16	7.5	3	-17	-39	...	...
14	9.1	22	6.7	0	-28	...	...	...
15	8.5	27	6.3	-4	-36	...	...	...
16	8.3	29	6.1	-6	...	...	...	...
17	8.2	31	6.2	-7	...	...	...	...
18	8.3	31	6.1	-7	...	...	...	...
19	8.3	31	6.3	-6	...	...	...	...
20	8.0	32	6.1	-9	...	...	...	...
21	7.5	32	5.8	-14	...	...	...	...
22	7.7	32	5.9	-12	...	...	...	...
23	8.4	32	6.4	-4	-39	...	...	...
24	7.8	32	6.0	-11	...	...	...	...

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.7	12	16.7	14	16	12	5	-4
2	22.2	11	17.0	11	15	12	6	-2
3	22.4	10	17.0	10	14	12	6	-2
4	22.6	10	17.6	9	14	12	6	-1
5	22.5	11	17.1	10	14	12	6	-1
6	22.5	11	17.1	12	15	13	7	-1
7	22.3	12	17.0	14	17	14	7	-2
8	21.4	13	16.3	18	18	13	5	-5
9	19.7	15	15.1	23	18	11	0	-12
10	17.7	19	13.4	28	17	6	-9	-27
11	15.8	20	12.1	25	11	-3	-23	...
12	14.0	21	10.7	21	2	-16	...	...
13	12.9	22	9.8	16	-7	-28	...	...
14	12.1	24	9.2	12	-14	-38	...	...
15	11.5	24	8.7	8	-21	...	...	...
16	10.9	24	8.4	3	-27	...	...	...
17	10.6	25	8.0	0	-33	...	...	...
18	10.5	25	8.0	0	-34	...	...	...
19	9.6	25	7.3	-10	...	...	...	...
20	8.2	26	6.3	-29	...	...	...	...
21	8.2	26	6.4	-30	...	...	...	...
22	11.0	18	8.3	3	-24	...	...	...
23	15.8	14	12.3	17	7	-4	-21	...
24	19.8	12	15.3	16	15	9	0	-12

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.6	2	9.5	2	1	-4	-15	-28
2	12.9	5	9.1	6	1	-7	-20	-35
3	12.3	8	8.7	8	0	-9	-25	...
4	11.8	11	8.4	9	0	-12	-29	...
5	12.0	12	8.6	10	0	-11	-29	...
6	12.7	13	9.1	12	3	-8	-24	...
7	14.1	15	10.2	15	7	-2	-15	-31
8	15.6	12	11.4	13	7	-2	-15	-30
9	13.5	9	11.1	8	0	-10	-26	...
10	11.5	2	8.9	2	-6	-18	-36	...
11	9.9	-6	7.6	-1	-10	-23	...	...
12	8.9	-15	6.8	-2	-11	-23	...	...
13	8.4	-35	6.4	-11	-20	-33	...	...
14	8.1	...	6.2	-23	-31	...	...	...
15	8.1	...	6.3	-34	...	...	...	...
16	8.1	...	6.1	...	...	...	...	...
17	8.1	...	6.2	...	...	...	...	...
18	7.7	...	6.0	...	...	...	...	...
19	7.4	...	5.7	...	...	...	...	...
20	7.6	...	5.9	...	...	...	...	...
21	8.9	...	6.7	-32	-34	...	...	...
22	11.3	-16	9.0	-6	-5	-10	-20	-34
23	14.1	-7	10.7	-6	-3	-7	-15	-26
24	14.4	-2	10.1	-3	0	-3	-11	-22

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.9	18	9.8	15	3	-11	-31	...
2	13.1	8	9.9	8	1	-9	-25	...
3	15.9	5	12.5	3	4	0	-10	-22
4	19.5	5	14.8	-1	5	4	-1	-9
5	20.5	3	15.9	-5	3	3	-1	-9
6	20.4	2	15.4	-7	2	2	-1	-9
7	20.4	2	15.4	-8	1	2	-2	-9
8	19.9	2	15.0	-7	1	1	-3	-10
9	18.7	2	14.2	-5	2	0	-5	-14
10	17.0	2	12.9	-1	2	-1	-10	-21
11	14.9	3	11.2	2	1	-6	-19	-34
12	12.9	4	9.8	4	-3	-14	-32	...
13	11.3	7	8.5	4	-10	-26	...	...
14	10.2	12	7.7	2	-18	-39	...	...
15	9.7	19	7.3	0	-26	...	...	...
16	9.3	23	6.9	-2	-33	...	...	...
17	9.1	26	6.9	-4	-37	...	...	...
18	9.0	27	6.8	-5	-39	...	...	...
19	9.0	28	6.8	-4	-38	...	...	...
20	8.5	28	6.5	-10	...	...	...	...
21	7.7	29	5.9	-20	...	...	...	...
22	7.7	29	6.0	-19	...	...	...	...
23	9.9	27	7.4	2	-27	...	...	...
24	10.9	28	8.4	12	-10	-33	...	...

VK WEST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.5	10	15.5	13	13	9	0	-11
2	21.3	10	16.1	13	14	10	2	-8
3	21.8	10	16.8	15	15	11	3	-6
4	21.8	11	16.3	17	16	12	4	-6
5	21.5	12	16.1	20	18	13	4	-7
6	19.6	16	14.8	25	19	12	0	-14
7	17.4	19	13.1	27	17	6	-9	-26
8	15.2	23	11.5	27	12	-1	-21	...
9	13.2	26	9.9	22	4	-14	-38	...
10	11.4	29	8.5	15	-7	-29	...	...
11	10.2	31	7.6	10	-17	...	...	...
12	9.6	32	7.2	6	-23	...	...	...
13	9.1	33	6.8	2	-29	...	...	...
14	8.8	33	6.5	0	-33	...	...	...
15	8.8	33	6.6	-1	-34	...	...	...
16	8.9	33	6.6	0	-33	...	...	...
17	8.2	34	6.2	-5	...	...	...	...
18	8.2	34	6.3	-5	...	...	...	...
19	8.0	33	6.1	-7	...	...	...	...
20	8.2	25	6.3	-6	-38	...	...	...
21	10.1	18	7.4	5	-17	-39	...	...
22	13.4	15	10.3	13	1	-12	-32	...
23	16.7	12	12.8	15	9	1	-12	-29
24	19.1	11	14.6	14	12	6	-3	-16

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.0	3	15.9	-12	1	3	2	-3
2	21.7	6	16.4	-7	4	6	4	-1
3	21.4	9	17.2	0	9	9	6	0
4	19.9	13	15.9	8	13	12	7	0
5	19.0	17	15.1	17	18	14	7	-2
6	18.2	21	14.4	25	21	15	6	-5
7	17.4	25	14.1	30	23	15	4	-9
8	16.5	26	12.9	31	21	11	-2	-18
9	15.0	26	11.2	28	15	1	-16	-37
10	12.7	28	9.6	23	5	-12	-36	...
11	10.9	30	8.2	15	-7	-28	...	...
12	9.8	31	7.3	9	-17	...	...	...
13	9.3	29	6.9	5	-22	...	...	...
14	9.0	20	6.6	2	-22	...	...	...
15	8.9	11	6.7	2	-19	...	...	...
16	9.0	2	6.7	2	-14	-32	...	...
17	9.2	-4	6.9	2	-10	-25	...	...
18	8.8	-12	6.7	1	-9	-22	...	...
19	8.2	-29	6.2	-4	-14	-28	...	...
20	8.3	...	6.4	-12	-19	-33	...	...
21	10.3	-18	7.6	-1	-2	-10	-23	-39
22	13.9	-7	10.7	-6	0	-3	-10	-21
23	17.4	-1	13.3	-11	0	0	-3	-11
24	19.8	1	15.1	-13	0	2	0	-5

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs

*** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder.

*** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver.

*** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card.

All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage.

ONLY from M Delahunty, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● HF MOBILE WHIP ANTENNAS, ex RAAF, designed for helicopter use, remote tuning 2.3 MHz — 9.1 MHz, but easily modified for other tuning ranges. 12v tuning motor. Consists of a base loading coil in a 1.6 metre high radome with a straight 1 metre whip (standard 3/8-26 TPI thread) screwed on top. Unused units $80, used but supposedly working order $60, some used with no top whips $50, all plus freight, (hopefully under $20) from Dubbo. Needs simple control unit, circuit supplied. Phone (068) 88 5265. David Walters Electronic Services P/L. VK2AYO.

● ACCOUNTING SOFTWARE designed by Banking professionals, suitable for Small Businesses, Clubs, Membership Societies, and personal applications. Easy to operate, no special skills required. Financial reports include Cashbook, Profit/Loss, Balance Sheet, General Ledger, and Bank Reconciliation. User amendable Chart of Accounts built-in. Includes manual and on-line support, $265-00. Standalone Invoices module, $240-00. Fully Integrated system of Accounting with Accounts Receivable and Payable, $535-00. General business services, Hardware, LANS etc at competitive prices. 5% discount off all software for AR readers who quote this advert. Samples and demo disks ($10-00, refundable on sale) available. BOOKMATE COMPUTER SERVICES PTY LTD, 6 Ann Court, Aspendale Vic 3195 (03) 580 6424 Fax (03) 580 8380 (VK3UV) A.C.N. 005 420 548.

FOR SALE NSW

● EIMAC socket SK800B, chimney SK806, tubes 4CX1500B, JENNINGS vacuum relay. VK2DTR, (02) 918 3835.

● 3 EL YAGI 10-15-20m, $150. VK2BPM (02) 623 3606.

● REALISTIC Comm Rx DX160, 150 kHz to 30 MHz, $50; REALISTIC Comm Rx DX302 digital readout, 10 kHz to 30 MHz, $150. ex VK2AMK (deceased). (043) 96 3172.

● KENWOOD linear amp, 2 kW PEP, rarely used, for quick sale $2,000 (save $1,000), S/N 2010080. VK2IH QTHR (043) 677 499.

● AMATEUR RADIO PROGRAMS for C64 sending CW and contests. Free of charge. Send diskette P&P, GPO Box 3209 Sydney NSW 2001. VK2BQQ (02) 957 6808.

● KENWOOD TS120V xcvr, matching Kenwood TL120 Lin amp. Cables, manuals, $690; KENWOOD R2000 gen cov Rx, mint cond, manual, $650; all orig packing. Ron VK2AHI (066) 621 902.

● ALTRON 3 EL mini beam, 6/10/15/20m, max elem length 3m, boom length 3m, complete with spare set coils and full instr. Stan VK2DHS QTHR (02) 349 3741.

● CA-5SS trapped vertical antenna, 5 band, 3.6 MHz to 28.5 MHz. Tony VK2VMB QTHR (065) 686 754.

FOR SALE VIC

● KENWOOD TS120S HF xcvr, GC, $475; ICOM IC900A 2m, 70 cm, 6m, minimal use, 25w O/P, $995; ICOM IC-HM9 mic $40. Peter VK3YF (058) 216 070.

● COLLINS KWM1 xcvr, VGC, incl DC PSU, H/book etc, $475. Rob VK3JE (060) 371 262 or (03) 584 5737.

● GALAXY V MK2, 80-10, xcvr, 400w PEP, with remote VFO, 800v PSU, spare 6HF5s, manual, as is $150; HT PSU, transformer 750-1000-1250-1500 CT 200 mA, 866s, inc neg bias supply, both metered, in metal case, $80; Z80 MICROBEE premium computer, double disk drive, amber mon, some keys faulty, plus software, $100. VK3ADY QTHR (03) 499 2539.

● COMPUTER monitor (ex Microbee) 30 cm screen, green, phosphor CRT, input phono pin jacks, 75 ohm or higher impedance. Reasonable cond, best offer. VK3NFJ QTHR (03) 803 2982.

● ICOM IC-229H 2m 50w FM xcvr, gen cov rx. UT-50 CTCSS, serv manual. New price $880. As new with orig packaging and access, $550. Adam VK3ALM QTHR.

FOR SALE QLD

● MONSTER ELECTRONICS SALE, Kenwood, Icom xcvrs, BIRD pwr meters (electronic parts), valves, transistors, coax, test equipt, antenna bits etc. Location Lot 2 Markwell Road, Caboolture QLD. VK4BU QTHR contact via Fred VK4DY (074) 961 186. Red Rptr 8.00 am 17th July 93.

● VALVES, transmitting, receiving, collectors, renovators (state which), some unused, tested, Europeans, metals, numbers, rectifiers, regulators, sockets, ceramics, shields, 807, 6146, 6V6, 832, QV08/100, 6v, 12v, many types, reas prices. Ted VK4YG, QTHR Box 245 Ravenshoe (070) 976 387.

FOR SALE SA

● KENWOOD TS130S, 100w, WARC bands, base or mobile, five band hel/whip ant, SP40 mag spkr, bumper ant fitts, PS30 DC reg PSU. Best offer. Bert VK5AUS QTHR (08) 344 5011.

FOR SALE WA

● KENWOOD SW200 SWR & PWR meter, $80; FT26 2m handheld, $300; 4 el cubical quad for 10 & 15m on 18ft boom, $350. Dave VK6PDE (09) 398 3670.

WANTED NSW

● HF BEAM, tilt over tower, Rotator. Malcolm VK2BMS QTHR (02) 257 4583 (bus) (02) 958 1114 (ah).

● YAESU FT101, early model considered, must have h/book and ownership details. Good price for good unit. Write PO Box 353, Avalon Beach NSW 2107.

● NALLY CRANK UP/TILT OVER tower with/without rotator in good condition. VK2DM QTHR (049) 46 7674.

WANTED VIC

● WHIP antenna, Icom AH-2B complete with mounting h/ware. Henk VK3CAQ QTHR (051) 221 885.

WANTED QLD

● TEN-TEC Century 21 or DELTA with manual. Must be in good cond. No mods. Also copy of manual for HEATHKIT "Q" multiplier mod QF1. Will cover photocopy costs. Dick VK4GOR QTHR (07) 379 1600.

● CATHODE RAY TUBE single gun, Hitachi 5UPIF or equiv for BWD 509B CRO. John VK4TL (070) 968 328.

● OLD HF AMPLIFIERS, basket cases or not, with PSUs. Prefer 813 decks but will consider others. Monoband or multiband units OK. Contact "Doc" VK4CMY for "Granite Belt Amateur Radio Group". (076) 616 200 (bus) (076) 852 167 (ah)

WANTED SA

● CIRCUIT for AWA RX type No IC8388, uses octal valves, copying costs paid. Andy VK5AAQ QTHR (08) 322 1010

WANTED TAS

● TWO KENWOOD TU-5 CTCSS tone units, to suit TS-711A and TS-811A xcvr, must be genuine parts. Price and details to David, VK7ZDJ (004) 252 030.

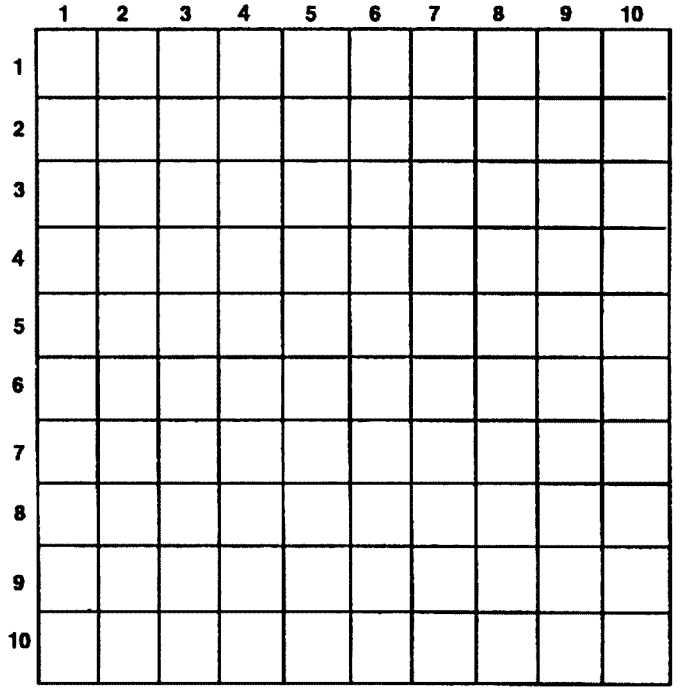
MISCELLANEOUS

● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, or Tel (03) 728 5350. Let us save something for the future.

ar

Morseword 76

Solution Page 56



© Audrey Ryan 1992

Across:
1 Part of a book
2 Severe
3 Donate
4 Council dues
5 Cuddle
6 Grow Dim
7 Writing Fluids
8 Indian cat
9 Private
10 Comforts

Down
1 Spouse
2 Poems
3 Port Phillip is one
4 Charter
5 Prison
6 Rips
7 Weirs
8 Thick
9 Former NSW premier
10 Fibs

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a seperate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958
MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members" amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

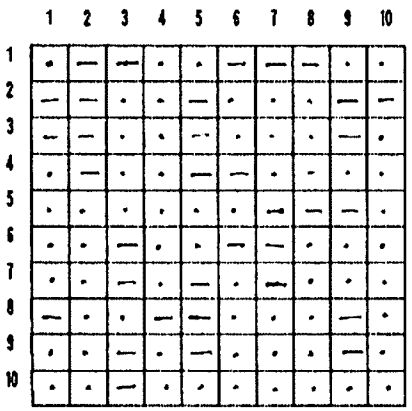
VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

Solution to Morseword 76

Page 55



Solution to Morseword 76

Across: 1 Page; 2 Grim; 3 Gave; 4 Rates; 5 Hug; 6 Fade; 7 Inks; 8 Tiger; 9 Inner; 10 Eases.

Down: 1 Wife; 2 Odes; 3 Bay; 4 Hire; 5 Jug; 6 Tears; 7 Dams; 8 Dense; 9 Wran; 10 Lies.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX183	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1988	BX259	$104.00
Easy Up Antennas	MFJ38	$39.25
Q-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX182	$15.00
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk .	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX028	$49.00
Practical Wire Antennas — RSGB	BX298	$28.00
Reflections — Software 5 inch disk	BX358	$20.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.80
Smith Chart Expanded Scale PK of 10	BX903	$6.60
Smith Charts S/Scale 1 SET co-ord Impl/Admir Pack of 10	BX901	$8.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$8.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX184	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BAIC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$48.95
Radio Call Book North America 1998	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley OTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX208	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX389	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.96
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX288	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX387	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1938 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX198	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1976	BX283	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	RX181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BX188	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX390	$18.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1988	BX262	$79.90
Radio Auroras — RSGB	BX381	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 35" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$18.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$16.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$36.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing — ARRL	BX388	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX398	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$36.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$16.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX166	$38.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1988 — ARRL	BX167	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX168	$20.00
Packet Computer Networking Conference No 7 1989 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Mads Easy — Rogers	MFJ32	$20.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX189	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX328	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX218	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX448	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$16.50
Spread Spectrum Source Book — ARRL	BX385	$40.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX288	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$48.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Car Bumper Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

ICOM

Count on us!

Ham heaven.

Some days Duncan thinks that he must have died and gone to heaven. Whichever way he turns he is surrounded by the finest ham radios around. What's a guy to do? He plays with them all day. And if that wasn't good enough, he gets paid for it as well.

Duncan Baxter...well VK 3LZ actually, let's call him by his 'real' name, is our resident ham radio expert. No one knows the Icom range better than VK 3LZ. He's been with us virtually from the start, some ten years in fact.

Now, if you'd like to find out about the latest in base stations, or virtually anything else to do with amateur radio operation, why not give VK 3LZ a call. Or you could simply drop in and see him at ham heaven ... err ... our head office that is.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call: (008) 338 915 Ph: (03) 529 7582 Fax: (03) 529 8485 A.C.N. 006 092 575

LL BROWN ADVERTISING 4558

AMATEUR RADIO

AUGUST 1993
Volume 61 No 8

Journal of the Wireless Institute of Australia

Amateur Radio and Dick Smith's Transcontinental Balloon Crossing

KENWOOD

...pacesetter in Amateur Radio

Compact Milestone!

Kenwood unveils the world's smallest HF transceiver

HF is going places—thanks to Kenwood's new TS-50S, the smallest transceiver of its kind in the world. Providing high-performance communications with go-anywhere convenience, the TS-50S is your passport to freedom. And whether used for mobile operations and DX-peditions, or in a fixed installation, this rig packs a powerful punch. Maximum output is 100W, and there's a full range of advanced features—including 100 memory channels, DDS with innovative "fuzzy" control, and AIP for superior dynamic range. IF shift and CW reverse mode help reduce interference, while a noise blanker improves clarity. For user-friendly operation on the move, there's a multi-function microphone and powerful menu system. And the TS-50S is fully equipped for split-frequency operations. Test drive one today.

TS-50S
HF TRANSCEIVER

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD
(ACN 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre
Homebush, NSW 2140, Australia. Tel (020 746 1519
Fax; (02) 746 1509
NSW Emona Electronics Sydney (02) 211 0988
Lake Macquarie Communications Cardiff (049) 567 255
ACT Watts Communications Fyshwick (06) 280 6416
QLD Kenwood Communications Albion (07) 357 6830.
VIC Strictly Ham Bayswater (03) 729 7656 Stewart
Electronics Components Huntingdale (03) 543 3733
SA International Comms Systems Port Adelaide (08) 473 688
WA Leda Electronics St James (09) 361 7821
Tower Communications, Victoria Park (09) 470 1118.
TAS Elgin Pty Ltd Launceston (003) 312 711,
Elgin Pty Ltd Hobart (002) 344 5000
FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

Journal of the Wireless Institute of Australia

Vol 61 No 8 ISSN 0002-6859 August 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bill Roper VK3BR
Editor
Bill Rice VK3ABP
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
WIANEWS Editor
Roger Harrison VK2ZTB
Contributing Editor
Ron Fisher VK3OM
PRODUCTION
Bill Roper VK3BR
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
June Fox
CIRCULATION
Chris Russell VK3ARZ
Sue Allan

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	**Editorial**	**Hamads**
September	9/8/93	11/8/93
October	6/9/93	8/9/93
November	11/10/93	13/10/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

Main picture: Dick's balloon photographed over Cobar, NSW. Dick carried his Yaesu HF rig aboard the gondola.

Inset: A youthful observer takes in the wonder of amateur radio at mission control for the Transcontinental Balloon Crossing at Australian Geographic's Terrey Hills, Sydney, headquarters. Jo Harris VK2KAA operating, Stephen Pall VK2PS (standing) looking on.

(Pictures courtesy Australian Geographic)

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service
Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:
Bill Roper VK3ARZ

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

FEDERAL QSP

It's amazing how time flies and the time has come around again to put fingers to the keyboard and write another Federal QSP column. By the time you read this another quarterly meeting of the Federal Council will have been held in Melbourne. These meetings bring the Council together regularly on a myriad of matters pertaining to our hobby which require the Council's consideration. At the Divisional level the Divisional Council meets regularly considering matters which apply at that level. All these people, plus most of those supporting them, are volunteers. There are only a limited number of paid staff involved.

It has been my experience, in both this hobby of amateur radio as well as other groups I have been involved in, that volunteers are usually hard to find and that it's usually the same old group who does the work. That works for only a short period — until those who are doing all the work start to suffer from burnout and decide to leave it to the others. When that happens, unless new faces have been found, there are fewer people doing the work, causing more burnout and so it goes on. This problem is not new and has been faced by all WIA Councils at some time or other. How many times can you remember when there have not been sufficient candidates to warrant an election for positions in your Division?

You might think it is a good situation not to have to bother about elections but in the long term it is us, the members of the amateur fraternity, who will suffer. How do we get over this problem and maintain a steady flow of new blood into the non-radio side of the hobby?

One approach taken by my local Division is to limit the number of consecutive terms that an individual can serve in any one position. By this means, people are at least forced to rotate through some of the available jobs, or new people found so that some of the present incumbents can retire from the scene for a while to re-charge their batteries. While this approach works for my local Division, it is not necessarily the answer for others. In any event, it can only work if there are fresh people willing to stand up and be counted.

Do you always agree with what your Division or the Federal Council is doing? Probably not — we are never all always satisfied with what's happening. What can you do about it? Rather than just bleat to anyone who will listen, or spread unfounded rumours about what your elected representatives are doing, write to them or go see them, have an eyeball contact and let your views be known. While you are there, find out more about how things work at the Divisional and Federal level. If you think that you can do better, then stand up and be counted — nominate for a position at your next Council elections. No-one is going to be offended by your standing. Who knows, you may even get elected. If not, at least you have tried. Don't give up, however, try again next time.

Most Divisions have elected their Councillors and appointed or elected their Federal Councillor for the coming year. That makes this the ideal time to start finding out about the workings of the WIA so that you can be better informed and ready to volunteer when the next elections are held. Remember, without volunteers, the WIA (both at the Divisional and Federal level), the Radio Clubs and all they provide will stagnate and die. Not only do you need your hobby, your hobby needs you!

Kevin Olds VK1OK
Federal President
ar

Amateur Radio and the Transcontinental Balloon Crossing

*Roger Harrison VK2ZTB**

Amateur radio played a strong role in Dick Smith's crossing of Australia by balloon, organised and coordinated by the WIA's NSW Division.

The general details of the story of Dick Smith's successful crossing of the Australian continent by balloon is, by now, generally well known, having gained considerable press, radio and television coverage in June this year. As some readers may have noticed from television coverage, or from frantic activity on the HF bands, amateur radio was an integral component of the event. This is the story behind it.

Tipped off

A tip-off to the Federal Office in mid-1992 suggested the WIA might somehow become involved in Dick Smith's Transcontinental Balloon Attempt, then in the planning stages. The Federal Secretary/General Manager, Bill Roper VK3ARZ, passed the news to me and I followed up with a letter to Dick, whom I have known personally since the early 1970s.

I wrote to him in early September 1992, offering the support of the NSW Division in arranging communications between the balloon and the Terrey Hills headquarters of his publishing company, Australian Geographic.

Dick's secretary faxed me at the Division in early November to set up a meeting to discuss the project. Subsequently, we had a working lunch in his office on 1st December in which Dick outlined the general history of long distance balloon flights and the six previous attempts to Cross Australia by balloon — none of which had been made by an Australian. Dick's aim was to set that right and have a ripping adventure into the bargain!

Dick revealed he planned to carry his Yaesu HF rig and an antenna tuner in the gondola slung beneath the balloon, driving a dipole-type

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weakly News Broadcasts		1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Roger Harrison Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2ZTB	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $56.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to *Australian resident* (F) (G) (X) grades at fee x 3 times.

antenna which was to have one half sewn into the balloon canopy, the other half trailing below.

He had been in touch with his old firm, Dick Smith Electronics (which he sold off to Woolworths in the early 1980s), which distributes Yaesu amateur equipment in Australia, and had obtained their support in providing equipment for amateur radio communications between the balloon and Australian Geographic in Terrey Hills.

Dick explained that he was setting up a "Mission Control" centre in the recently-built visitors centre and presentation facility at Australian Geographic and took me on a tour of the large, open room. Major sponsors and supporters, Telecom and the Bureau of Meteorology, among others, were to have space there for the duration of the attempt and he wanted an amateur station there as well. His plan was to have Mission Control open to visitors 24 hours a day and he wanted the amateur station continuously operational. A tall order!

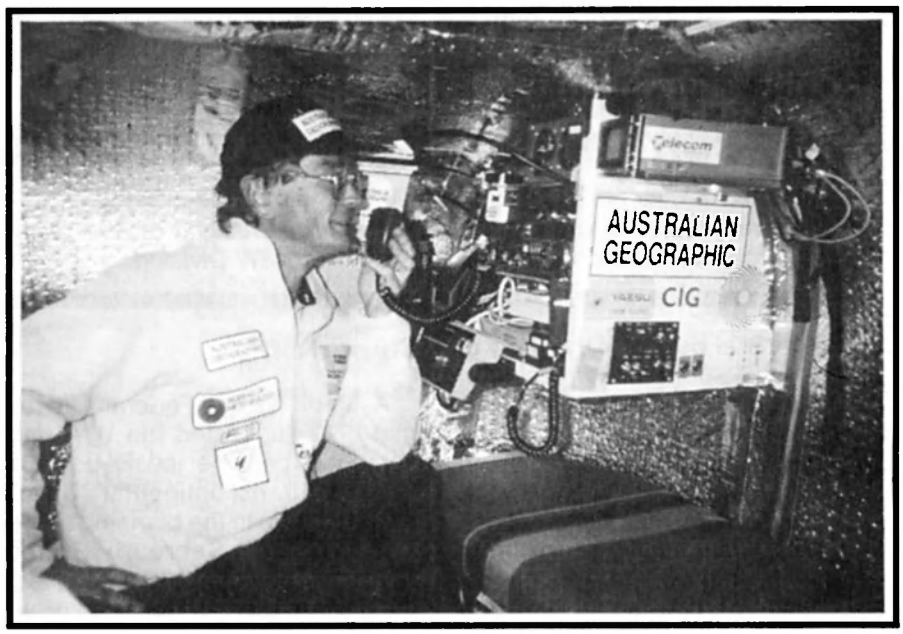
As schools were being invited to visit Mission Control during the balloon's crossing, there was an opportunity to expose youngsters to the excitement of amateur radio, and Dick also wanted to use amateur radio as "fallback" communications to Mission Control, if necessary. He saw the Mission Control station acting in a net control role during times when he would be on the bands.

The opportunity to involve amateur radio — and the radio amateurs of Australia — in an historic event, provide an element of practical communications support, and to take advantage of a tremendous publicity opportunity was one that could not be passed up.

Planning

The day after my lunch with Dick, I phoned the amateur radio products manager at Dick Smith Electronics, Chris Ayres VK2YUK, to discuss the project. He outlined the role DSE expected to play in providing equipment and we agreed to liaise as things developed.

I subsequently advised the Divisional Council, who were enthusiastic at having the Division involved and discussed the event with Divisional Special Projects Officer, Stephen Pall VK2PS. Steve was immediately enthusiastic and agreed to provide whatever assistance was within his capabilities, particularly in regard to finding volunteers to staff the Mission Control station and coordinating its operation.



Dick Smith in the gondola of the balloon.

We discussed the possibility of obtaining a "special event" callsign and what logistic arrangements would be necessary.

The flight was scheduled to take off on Monday, 31 May 1993, from Carnarvon in Western Australia, which gave us a short six months.

Steve Pall, Chris Ayres and myself had a planning meeting at Australian Geographic early in the new year, surveyed the proposed Mission Control centre and planned where antennas might go. The centre overlooks a bushland garden area, with a small lake and wandering emus! The antennas had to go behind the lake.

A little propagation planning (using the Graph-DX computer program!), and calling on past experience, told us that we'd need to use 14 MHz and a beam to achieve good quality signals between Sydney and Western Australia. We'd be able to use 7 MHz as the balloon approached the eastern states, so a dipole or perhaps a long wire would serve.

Chris indicated that DSE would provide two rigs, a Yaesu FT1000 and an FT990, so two stations could possibly be on-air at the one time.

As planning progressed, we had to find a beam and support tower for 14 MHz operation. Rudi Breznik of Emtronics was approached and agreed to help out.

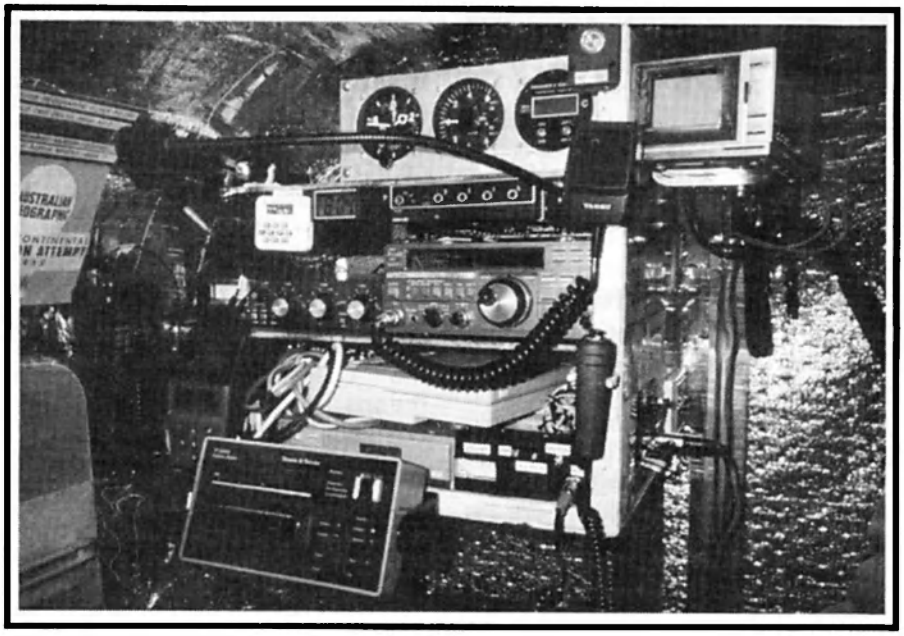
I approached the NSW branch of DoTC to obtain a special event callsign and the Division was duly issued with VI2AUS, to use between 1 June and 30 June.

Final days

A few weeks before the scheduled launch, we were advised we had access to the Mission Control centre to setup. Chris Ayres and Steve Pall did sterling work in setting up the equipment. The NSW Division's large, painted canvas sign saying "Amateur Radio We Talk to the World" was slung on the wall above the station, with a roundel of the Division's logo beneath it. A panel carrying amateur radio publicity material and QSL cards was set up adjacent to the equipment desk.

Publicity material on the hobby of amateur radio and the WIA's role in the hobby, aimed at the general public, was provided as a handout.

A press function was called by Dick ten days before leaving for Carnarvon at which we had the opportunity to explain to the attending press and TV



The control console in the gondola. Note the amateur radio installation. (Photos courtesy Australian Geographic)

crews how amateur radio would be involved in the event.

Dick publicised the Transcontinental Balloon Attempt in Australian Geographic early in 1993, including a large wallposter. A limited number of spare copies of this wallposter were obtained and inserted in VK2, VK4 and VK6 copies of the May issue of Amateur Radio to publicise the event and amateur involvement.

The coming event was also publicised on the NSW Division's Sunday broadcasts during May.

A briefing of the 15 volunteers organised by Steve Pall was held on the weekend before the launch to familiarise them with the equipment and the operations.

Up and away

After a setback on the scheduled launch date on 31 May, Dick had to await favourable weather conditions. The chance came on 16 June, and Dick and co-pilot John Wallington were away.

VK2AWI at Mission Control immediately became active and operated over the subsequent 40 hours of the flight. Eight volunteers operated over the two days, using 14 MHz and 7 MHz. There were a total of 230 QSOs in the 40 hours, and amateurs from every state and territory gave tremendous support. A number volunteered to act as relay stations on occasion, from VK6, VK5 and VK4. Their help was greatly appreciated.

The amateur operation gained some valuable coverage on television, which gave the whole event considerable air time.

Dick landed at 1713 EAST on Friday 18 June, some three kilometres north of Tabulam, a little village 40 km west of Casino in northern NSW.

To celebrate the event, VI2AUS was then activated. In the following 13 days, approximately 1500 contacts were made on CW, SSB, FM and packet. HF band conditions declined in the latter half of June, unfortunately, so VI2AUS operations had to tolerate poor conditions. Six volunteers activated the callsign.

Dick Smith Electronics is having a special QSL card printed for VI2AUS operations. All those who made contact, or listeners who heard the station, should QSL via VK2WI. For those who contacted VK2AWI, a QSL stamped to mark the occasion, can be obtained via VK2WI. If you want direct replies, please include a stamped addressed envelope.

Thanks

Heartfelt thanks to all those involved in making this event the success it turned out. Firstly, to Dick Smith VK2DIK for providing the adventurous opportunity, and particularly Stephen Pall VK2PS for his tireless efforts and input of ideas, as well as Chris Ayres VK2YUK and the management at Dick Smith Electronics who provided the Yaesu equipment, NSW DoTC for VI2AUS, Rudi Breznik from Emtronics who supplied a beam antenna and portable tower, Stephen Montgomery from Australian Geographics and the team of amateurs who volunteered and participated, and the Australian amateur radio community for providing enthusiastic on-air support.

Locked Bag 888, Woollahra NSW 2025

ar

WIA News

Yaesu founder silent key

Sako Hasegawa, JA1MP, the founder of the Yaesu Musen company which manufactures the popular brand of amateur equipment, died in Tokyo on 12 June, according to a report in the 28 June issue of the *ARRL Letter.*

Hasegawa became involved in introducing single sideband to Japanese amateurs in the 1950s. In the following decade he was a driving force in opening up other new modes for amateurs, particularly radioteletype, said the report.

Honour for wife of well-known amateur

Norma Topp, wife of well-known NSW amateur, Aub Topp VK2AXT (NSW Divisional Librarian at Amateur Radio House, Parramatta), was honoured with the award of the Order of Australia Medal, the OAM, in June.

Norma received the medal in recognition for her services to the NSW Society for Crippled Children and to the Tall Women's Association. Congratulations, Norma!

Radiocommunications Act 1992 & "Judicious Rex"

*George Brzostowski VK1GB**

My attention has been drawn to a rumour among WIA members, particularly in Victoria, that I am the person posing under the pseudonym of "Judicious Rex". I would like to have the opportunity of dissociating myself from that person's article. The way "Rex" was described in the February edition of *Amateur Radio Action* magazine has such remarkable historical resemblance to my past, that I am really intrigued as to how much of that description was editorial (perhaps judicious?) licence, and how much was true. For my part I know of no other lawyer who has served as a WIA divisional federal councillor in the last 20 or so years, other than Mike Owen, who is now in the UK. I have reason to believe that Mike would not have written such an article.

While much could be said about the way in which that article was expressed, it is the content about which I would not be proud. For my part, I am not known for wanting to remain unaccountable through a cloak of anonymity. Some of the legal observations in "Rex's" articles have, I am advised, also affected my standing within the eyes of some DoTC officers. To that extent the quality of our anonymous friend's articles has affected my credibility, and I wish to correct both the record and the impressions.

The response by Mr Roger Smith, First Assistant Secretary, Radiocommunications Branch, Department of Transport & Communications in the May edition of ARA, goes some way towards allaying the needlessly aroused fears. However, as unnecessary fear is still being expressed by some members to the Federal Office of the WIA, I feel is it proper to go further, and to deal conclusively with Rex's mistaken notions.

"Mandatory Penalties"

Page 13 of ARA Vol 15, No 12, refers to some penalties being expressed as "imprisonment for up to 2 years", and then sets out in bold letters, warnings like "There is no provision for a fine", and "mandatory imprisonment" (twice). There is absolutely no substance for these allegations, and it is quite inappropriate to make them while failing to refer to the provisions of the Crimes Act 1910 of the Commonwealth. Mr Smith has referred to section 4B of that Act,

The day of the dragon has not yet arrived, and is unlikely ever to do so.

which provides that "where a natural person is convicted of an offence against the law of a Commonwealth punishable by imprisonment only, the Court may, if the contrary intention does not appear and the Court thinks it appropriate in all the circumstances of the case, impose, instead of, or in addition to, a penalty of imprisonment, a pecuniary penalty not exceeding an amount calculated using the formula

Term of imprisonment in months/6 × $3,000

This type of provision has been part of the Act for many years, and a form of it was previously found in section 16 of that Act. Perhaps in its simpler form it was easier to understand, but the point is that it was not the policy of the Commonwealth to deprive the courts from having power to tailor a penalty to fit the crime actually committed.

"Rex" tried to answer Mr Smith by emphasising the use of the word "may" and by claiming that the convicted person would have an onus to establish that the "contrary intention does not appear", and that "the court ought to think fit not to impose a term of imprisonment". That is applying the wrong standard. The convicted person does not have any onus cast upon him. The duty of a court considering what should be the penalty is also governed by the terms of section 16A, which sets out an extensive list of matters which the court must take into account. Here one will find references to "the nature and circumstances of the offence", or the "character, antecedents, age, means and physical or mental condition of the person", etc.

However that is not the end of the matter. Section 16C(1) must not be forgotten. "Before imposing a fine on a person for a federal offence, a court must take into account the financial circumstances of the person ....", and 16C(2) provides, "Nothing in subsection (1) prevents a court from imposing a fine on a person because the financial circumstances of the offender cannot be ascertained by the court." In other words, if a fine is felt to be appropriate, then a fine will be imposed. A person's poor financial circumstances will tend to minimise the degree of the fine.

There is a distinct requirement imposed on courts to consider every alternative to imprisonment first. Subsection 17A(1) makes it quite plain that "A court shall not pass a sentence of imprisonment on any person for a federal offence .... unless the court, after having considered all other available sentences, is satisfied that no other sentence is appropriate in all the circumstances of the case."

Finally on this point, there is section 19B providing for the discharge of deserving offenders without proceeding to conviction, ie placing a person on a good behaviour bond, and section 20AB providing for use of community service order schemes, which are now in force in all jurisdictions.

The above observations should allay all needless fears by people who are otherwise law-abiding citizens. The day of the dragon has not yet arrived, and is unlikely ever to do so.

When the 1982 Radiocommunications Bill was going through Parliament, I submitted that there should be an offence of possession of transmitting equipment without a

licence. For policy reasons, which have never been explained to me, there was no such offence provision. Section 23 of that Act made it an offence for a person to operate or have in his possession for the purpose of operation, a radiocommunications transmitter, except in accordance with a transmitter licence. One still had to prove the element of purpose of operation. In practical terms it meant one still had to prove actual use.

The recent Radiocommunications Act 1992 is an improvement, and despite its length, is somewhat easier to understand than its predecessor. That does not mean it is not confusing, so I will try to deal with the major provisions which may seem to affect radio amateurs.

Radiocommunications device

Sub-section 7(1) defines a "radiocommunications device" as —

(a) a radiocommunications transmitter *other than a radiocommunications transmitter of a kind specified in the regulations*, or

(b) a radiocommunications receiver of a kind specified in the regulations.

Sub-section 7(2) defines a radiocommunications transmitter as —

(a) a transmitter designed or intended to be used for the purpose of radiocommunication, or

(b) anything .... designed or intended to be ancillary to, or associated with, such a transmitter, for the purposes of that use.

Sub-section 7(3) defines a radiocommunications receiver, but I do not need to set it out here.

The important matter is that all transmitters are radiocommunications devices, except for those transmitters which are of a kind specified in the regulations. In other words, until there are any regulations, all transmitters are covered by this definition.

As far as receivers are concerned, no receivers are radiocommunications devices except those of a kind specified in the regulations. Until regulations specify any kind of receiver, all receivers are excluded from the operation of provisions pertaining to radiocommunications devices.

The above observations are consistent with Mr Smith's letter, and in total contrast with "Rex's" attempt to interpret the Act. I hope I have met "Rex's" challenge on page 32 of ARA Vol 16 No 1.

Non-standard devices

Sub-section 9(2) defines a "non-standard device as a device that —

(a) if the device has not been altered or modified in a material respect after its manufacture or, if it has been imported, after its importation — does not comply with the standard that was applicable to it when it was manufactured or imported ..."

In other words, a device in respect of which there was no standard at the time of its manufacture or importation, can never be a non-standard device.

Licensing of radiocommunications

Section 45 prohibits unlicensed radiocommunications, except in emergency, and permits the use of radiocommunications devices in accordance with appropriate licences.

Offences under 1992 Act

Section 46(1) provides that a person must not, without reasonable excuse, knowingly or recklessly, operate a radiocommunications device *(which by definition means all transmitters except those specified by regulations, and NO receivers until any class of receiver is also specified in the regulations)* otherwise than as authorised by a proper licence. If the radiocommunications device is a transmitter, the penalty is "imprisonment for 2 years" - remember "Rex's" alarm? If the radiocommunications device is NOT a radiocommunications transmitter, *(presumably a receiver of a kind yet to be specified in the regulations)* the penalty is specified as $2,000.

There is also the provision which prohibits a licensee from using his equipment outside his authorised bands. This covers cases where a piece of equipment, usually made overseas, can transmit beyond the Australian band edges. If you stay within the band, you have nothing to concern you.

Section 47 provides that a person must not, without reasonable excuse, have a radiocommunications device in his or her possession for the purpose of operating the device otherwise than as authorised by a relevant licence.

Both section 46 and 47 are subject to section 49 which saves a person who has used a radiocommunications device in serious emergency circumstances.

Section 48 gives an extended meaning to the words "possession for the purpose of operation" in section 46 and 47. This new definition goes some way to meeting my 1982 submissions to make possession without a licence an offence. I welcome the change.

Non-standard devices

Section 158 of the 1992 Act provides that a person must not, without reasonable excuse, have in his or her possession for the purpose of operation a transmitter that the person knows is a non-standard transmitter. The penalty for an individual offender is set at a maximum of $12,000. Section 159 has an extended meaning of possession for the purposes of operation.

Firstly, the penalty provision does not include imprisonment. There is no inconsistency between this section and section 46 . Section 46 prohibits the use of transmitters except as permitted by a relevant licence. Use of a sub-standard transmitter would not be use in accordance with a licence. Therefore if one had to one's knowledge, a non-standard transmitter in possession for the purposes of operation, one would not be committing as serious a breach until one actually used such a transmitter. Upon using that transmitter, one would be first committing a breach of section 46, and also a breach of section 158.

To make it easier for the prosecution to prove knowledge that a device is non-standard, section 161 allows the court to look at a person's abilities, experience, qualifications and other attributes.

However there is no warrant for "Rex's" allegation (AR Vol 15, No 12 page 14) that possession of amateur equipment which has been modified so as to enable it to transmit outside an amateur band is "non-standard". There must first be standards applicable at the date of modification. So far, there are standards applicable to CB radios and cordless telephones, and perhaps other low power devices. "Rex's" claims in his attempted reply to Mr Smith (ARA Vol 16, No 1, page 32) are so unhelpful, that I do not know about which legislative provision he is commenting. Pity. It might have been interesting. Mr Smith, on the other hand is quite correct.

Radiocommunication Devices

Section 301 provides a means of prohibiting traders from supplying "eligible radiocommunications devices" to consumers without production of a suitable licence by the buyer, and requires the supplier to record certain details. It is to be hoped that regulations will specify the classes of radiocommunications devices as "eligible devices", as otherwise the section achieves nothing.

It is a pity that there may be hiatus insofar as amateur equipment is concerned, and it is a pity that it does not cover the sale of transmitters on the non-dealer second hand market.

However what Mr Smith does say in his second point (on page 30, right hand column) is perfectly correct.

Regulations

Yes, there is a wide regulation making power, and yes, regulations made by the Governor-General are a subordinate form of legislation. They do however have to be laid before Parliament, {Acts Interpretation Act 1901, sub-sections 48(1)(c) and 48(3)-(7)} and may be disallowed, as has sometimes happened, particularly in

WIA News

NZART survey supports retention of Morse

A recent survey by the New Zealand Amateur Radio Transmitters (NZART), which questioned attitudes to the Morse Code among members, showed healthy support for competency in Morse Code as a prerequisite for full licence privileges.

According to a report on the survey results in the July issue of *Break-In*, the NZART's journal, an average 32% considered it essential, 44% considered it desirable, while remarkably, an average 22% believed Morse competency was unnecessary. The statistics were heavily qualified, though.

Members did not support a foreshadowed NZART Council move on approaching their licensing authority for a non-Morse HF licence. Some 64% of members believed New Zealand should never have a no-code HF licence.

the Senate. The Wireless Institute of Australia has established a good working relationship with the Department of Transport & Communications, and there is no reason to believe that it will be different with the new Spectrum Management Agency. I hope that it will be given all necessary resources.

The WIA has been consulted regularly in the past, and there is no reason to believe this will cease. On the contrary, there is a clear policy to engage in consultative processes, and the WIA will play its part.

Summary

Putting it bluntly, anyone who has a receiver, or a device which includes a receiver, which is not the subject of any regulations, can continue using such unspecified receiver without a licence. On this point "Judicious Rex" is simply wrong (ARA Vol 15, No 12, page 13), and it is a pity that such blatant errors mar an article which has otherwise some merit. It is a pity that some amateurs have been needlessly alarmed at the thought of having to dispose of their wide-band receivers.

If you have a modified transceiver or transmitter, ascertain if there was any standard in force at the relevant time. If there was no standard, then make sure you use it only in accordance with the terms of your licence, and that includes staying within the band edges. If you are a traditional amateur and delight in making your own, do not worry, there is no standard at present applicable to home-brew!

Finally, enjoy your hobby by obeying the licence conditions, staying within your band segments, and obeying ordinary rules of conduct. You can also help the WIA in its role by joining it, and getting others to join!

* *GPO Box 789 Canberra ACT 2601*

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

Random Radiators

with Ron Cook VK3AFW and Ron Fisher VK3AFW

Some months ago now, we promised details of a Z Match Antenna coupler that would operate on 160 metres. Well, we organised our local Z Match constructor to put together a prototype which was tried out locally and then dispatched to Z Match expert Lloyd Butler VK5BR for his analysis.

However, a basic description of it first. It is built along the lines of the original AR Z Match described in February 1993 AR but with a larger coil to tune down to 160 metres. We found that this unit would operate over the range of 160 to 20 metres. This seems to be a reasonable compromise for amateurs using a tri-band yagi and a centre fed (with open wire line) dipole for say 80 metres. With this coupler an 80 metre dipole will give excellent results on 160. See you on 160! Now over to Lloyd **Butler VK5BR.**

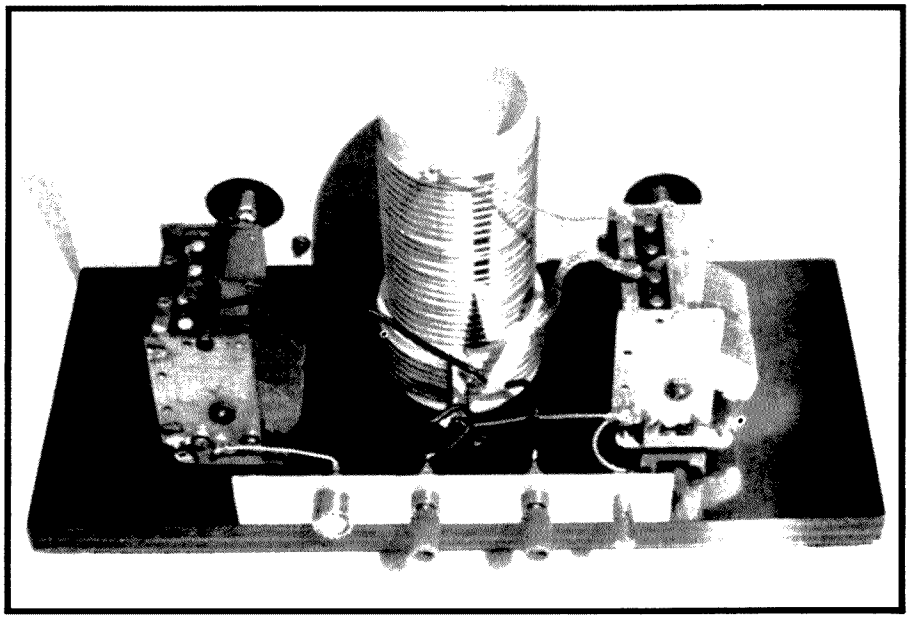
Some Tests on a Z match Tuner for 1.8 to 14 MHz

Introduction

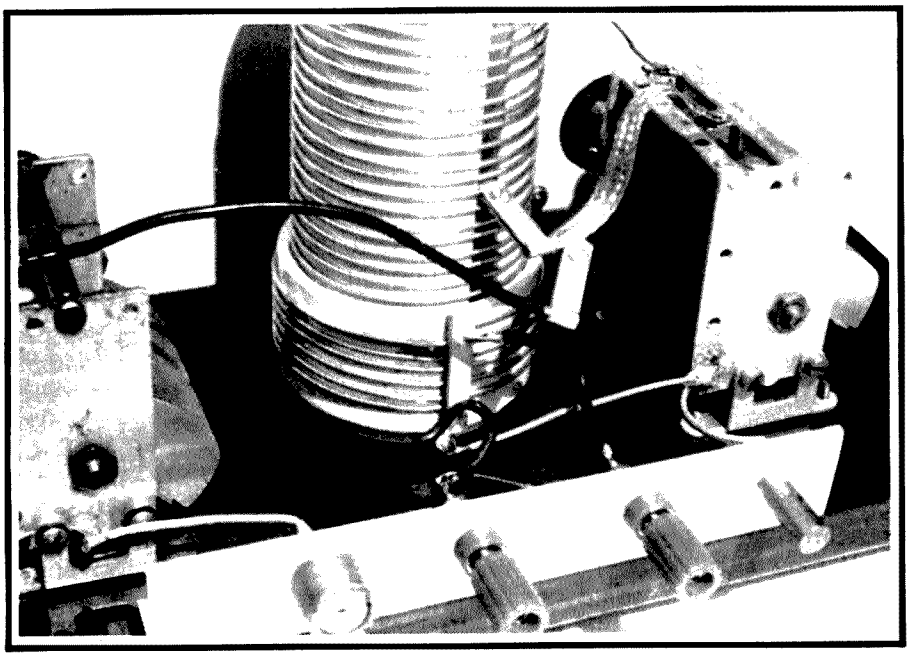
Our Melbourne Z match constructor has been busy again with a new coil assembly having higher inductance than that used in the AR Single Coil Z match which was previously introduced. The original AR circuit operated within the range of 3.5 to 28 MHz. I did show how the original circuit could be extended down to 1.8 MHz by switching in fixed capacitors but the idea of this new coil is to include 1.8 MHz without switching. In doing this, operation above 14 MHz is sacrificed for the lower frequency facility. The project is being introduced through the Random Radiators column and, as before, I have been seconded to carry out some tests and report on its performance. I will confine my discussion to the performance tests and refer you to my previous article (Ref 1) for more detail on the single coil Z match operation.

The coil assembly, as supplied, was made up of a 30 turn primary winding on 56 mm PVC tube and a 6 turn secondary winding on 65 mm PVC tube which was slipped over the cold end of the primary. Both windings were wound with 16 SWG (1.6 mm) tinned copper wire. The coil was constructed so that I could easily experiment with the coil tap positions to obtain the best performance.

As a result of a considerable amount of experimentation, I fixed the full coil connection at 27 turns and the



Rear view of 160 — 20 metre Z match.



Close-up view of output winding.

two taps on the coil at 12 and 20 turns as shown in figure 1. With this arrangement I was able to achieve a match over a resistive load range of 10 to 2000 ohms on each of the bands 1.8, 3.5, 7, 10 and 14 MHz. In this respect the new assembly performed much as did the AR 3.5 — 28 MHz unit. However, further on I will discuss a few limitations in its performance which were not apparent in the higher frequency range unit.

Tuning Curves

The input capacitance required as a function of load resistance for each frequency band is plotted in the family of curves, figure 2. The maximum capacitance plotted is around 450 pF but a little larger than this can be required where the load is partly reactive. I suggest the use of a variable capacitor around 600 pF, possibly made up with the sections of a two gang unit paralleled.

In a further family of curves, figure 3, shunt capacitance is plotted as a function of load resistance for each frequency band. The maximum capacitance plotted is around 430 pF but again I would suggest a larger two gang unit of around 450 to 500 pF per side to allow for certain complex loads.

More on the Performance & Some Restrictions

As I had previously done on other Z match tuners, limited tests were carried out with partly reactive loads. This particular unit handled inductive reactance quite well but on the 3.5 and 7 MHz bands its ability to match loads with capacitive reactance was restricted. Connected in series with a 50 ohm resistance, reactance that could be handled was recorded as follows:

1.8MHz	−1000 to +1000 ohms
3.5MHz	−500 to +350 ohms with a gap between −25 & −200 ohms
7.0MHz	−70 to +1000 ohms
10MHz	−1000 to +1000 ohms
14MHz	−500 to +300 ohms

Of course the restriction in reactance value also varies with the value of series resistance component but the chart illustrates the trend.

Another disadvantage of this particular Z match unit is its maximum power rating for a given tuning capacitor plate spacing. Relative to the higher frequency Z match, the whole tuning range has been shifted down by an octave in frequency but the tuning capacitances used are barely above those used in the higher frequency unit. The effect of this is nearly to double the loaded Q factor in the tuning system and nearly double the voltage developed for a given power. Let's consider an input capacitance set at 100 pF on 3.5 MHz. This gives a reactance of around 455 ohms and hence, for the input to look like 50 ohms, the loaded Q must be equal to 9. A power of 100 watts fed to the input develops a peak voltage of 100 V across the 50 ohms. This voltage is multiplied by Q to a value of 900

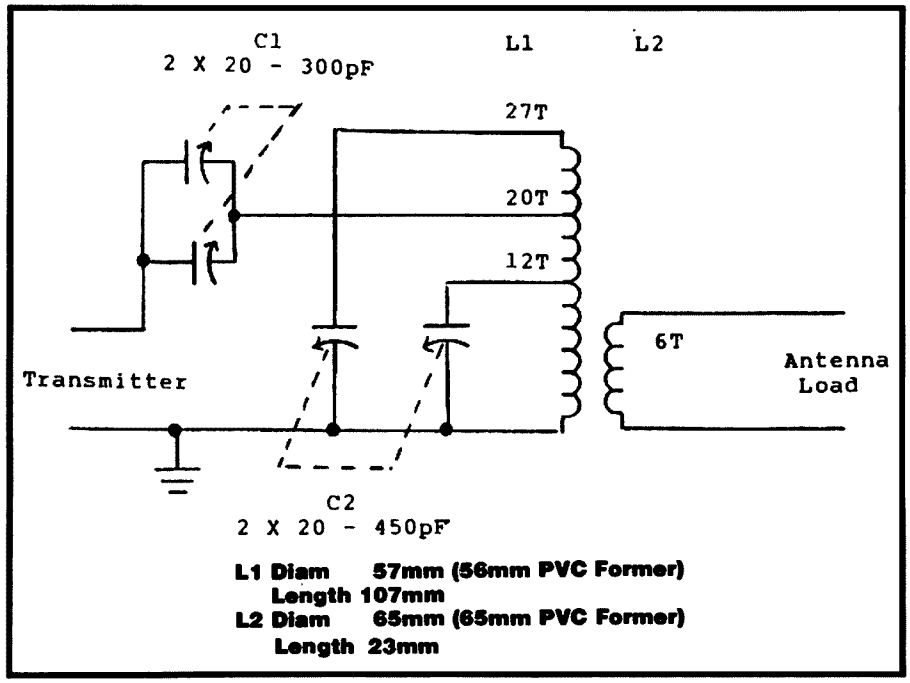


Figure 1 — Single Coil Z match Antenna Tuner 1.8 - 14 MHz.

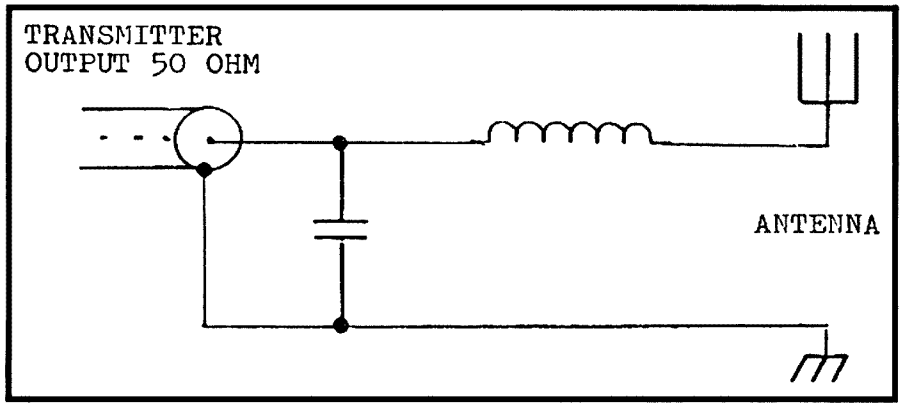


Figure 4 Simple L Match Network.

MHz antenna system via the Z match tuner with the measured current via a simple fixed L network which I normally use for that antenna. This type of network (figure 4) is probably as efficient a matching network as I could substitute. The antenna, operated against a counterpoise, measures around 30 ohms total resistance (that is, radiation plus loss resistance). Much of it is made up of a random length of feed line to another antenna and by chance rather than by design, its length happens to be such that its reactive component is small. To maintain equal power for the two measurements, power was set at 50 watts as indicated on an SWR/Power meter facing the transmitter source. Using the L network, antenna current was 1.28 amps which calculates to 49 watts into 30 ohms. Using the Z match, the antenna current was 1.22 amps, ie 45 watts into 30 ohms. The test indicates a slightly greater loss in the Z match but considering that the Z match is a continuously adjustable device to suit all sorts of loads, the result is good.

I short cut efficiency tests on all bands to doing one other test on 14 MHz, the other end of the Z match tuning range. On this band I ran a power of 10 watts and made use of a Marconi 50 ohm loading RF wattmeter. Using a similar comparison technique to that used on 1.8 MHz, power efficiency was derived as being near 80%.

Summary

The Single Coil Z Match tuner discussed matches a resistance load range of 10 to 2000 ohms at frequencies between 1.8 and 14 MHz without any form of switching. It doesn't work quite as well as the higher frequency range AR Single coil Z match described previously in Amateur Radio. I have highlighted two limitations in its performance as follows: Firstly, at 3.5 and 7 MHz it has a limitation in the range of loads it can match when there is capacitive reactance in series with the load. Secondly, because it generally operates with a higher loaded Q than in the other unit, voltages developed across the tuning capacitors are higher. If receiver type tuning capacitors are used, arcing could be experienced at 1.8 and 3.5 MHz, even at low powers, when antenna resistance is greater than 250 ohms. No problem should be experienced with arcing if high impedance antenna feed systems are avoided or if wide spaced tuning capacitors can be obtained.

Power efficiency measurements were essentially limited to tests with a load of 50 ohms and at the extreme frequencies in the tuner range of 1.8 and 14 MHz. From these measurements, power efficiency was considered to be good.

In conclusion we must summarise the differences in the performance of the Z match unit described and the higher frequency unit. In the simple single coil form without switching, the described unit tunes 1.8 to 14 MHz whereas the higher frequency unit tunes 3.5 to 28 MHz. The second unit can be extended down to 1.8 MHz by the addition of several high voltage fixed capacitors and a switch so that a range of 1.8 to 28 MHz is then achieved. As discussed in a previous paragraph, the described unit can be more prone to capacitor voltage breakdown and appears to be more restrictive in the range of reactive loads it can handle.

Thanks to Lloyd Butler VK5BR for that interesting test report.

So that's it for another month. Good luck with your antenna experiments and it's good bye from him and goodbye from me.

The two Rons.

References

1. Lloyd Butler VK5BR — The "AR" Single Coil Z match — Antenna Matching with One Fixed Coil and No Switches — Amateur Radio, April & May 1993.
2. Random Radiators (VK3OM & VK3AFW) — The "AR" single Coil Z Match — Amateur Radio, February 1993.

ar

WIA News

Celebrating first UK-Australia radio contact

It seems the first message ever transmitted by "wireless" between the UK and Australia happened 75 years ago, on 22 September 1918, according to a 1933 book titled, "Wireless Over Thirty Years," written by R.N. Vyvyan.

To celebrate the event, the Dragon Amateur Radio Club of North Wales will activate GB2VK on Wednesday 22 September from the site at old Caernarfon (now Waunfawr) Marconi station, and again on Saturday 25 September, 1993. A special QSL card is to be issued for contacts and reports.

Dragon ARC chairman, Dewi Roberts GW0ABL, has written to the WIA seeking not only publicity for the event, but information on who was involved at the Australian end of the first ever UK-VK contact, and who received the message. Can anyone help?

The Dragon Amateur Radio Club can be contacted at 23, Lon Hedydd, Llanfairpwll, Gwynedd, North Wales LL61 5JY.

How to Hit the Australian Repeaters — with 28,000 Tons!

Geoff Green VK6XB/VS6DA/G3ZNV went on a cruise, and discovered he was not the only ham on board.*

Having decided to treat ourselves to a "retirement" cruise, my XYL expressed a degree of surprise when I popped a 2m handheld into the suitcase (well, she had been reading "The French Atlantic Affair" where a ham radio operator saved the ship from hijackers!). In defence of the usual mutterings, I offered that it would be interesting to see if I could work some of the 2m repeaters listed in the VK Callbook.

We sailed from Singapore on the good ship Royal Odyssey, a magnificent vessel of some 28,000 tons. Our route was via Bali to Australia, with the first port of call Darwin.

Ships seem to make a habit of arriving at places at first light; however, not to be outwitted, and clasping handheld, I slipped out of the cabin (they call them staterooms these days) and climbed up to the elevation of deck 10. In the sunrise I could see the coast and I tried my first call — nothing. Well, it was rather early, even for Darwin. Then I heard something and responded, eager for that first contact. I glanced over to the opposite rail of the deck and was confronted by a mirror image! A ham with a handheld! I'm communicating with a fellow passenger. "Hi," he says, "I'm KT6X Dick". "VK6XB Geoff" I replied, and we burst out laughing. Subsequently we unearthed a further three hams from the bowels of the ship; but for now we were keen on the first contact through the Darwin repeater. It came in the form of VK8KZZ Peter, obviously a Darwin insomniac.

An early morning crewman swabbing the deck stared in disbelief as two hams danced a hornpipe, jubilant with their first contact as if novices — perhaps scurvy was setting in? (No way on this ship!). VK8PC Charlie followed, then VK8ZWM Spud, VK8CO Trevor, VK8RH Rex and VK8UK Bob.

It was more than 35 years since I had been to Darwin, and after lunch and a look around, Charlie very kindly offered to pick us up and take us to his QTH and meet Marilyn, his XYL. We even managed a sched on 21 with VK4LC, VK6AO and VK4EKK.

"An early morning crewman swabbing the deck stared in disbelief as two hams danced a hornpipe....."

Our all too short 12-hour visit was over, and Charlie dropped us back to the ship. As we sailed away, the VK8s kept us company as long as the repeater held in.

Our list showed a repeater on Thursday Island, but the pilot who came aboard there confirmed there was no activity — sad. So we had a mini-hamfest of the five on board, and invaded the radio room, much to the horror of the Chief Radio Officer who was clearly far more interested in studying the form on board than he was in having a heap of hams studying his black boxes! Joking apart, the staff were tremendous and were proud to demonstrate that the GPS of today is a far cry from the ships' brass bashing of the past, but the old 500 kHz alarm remains.

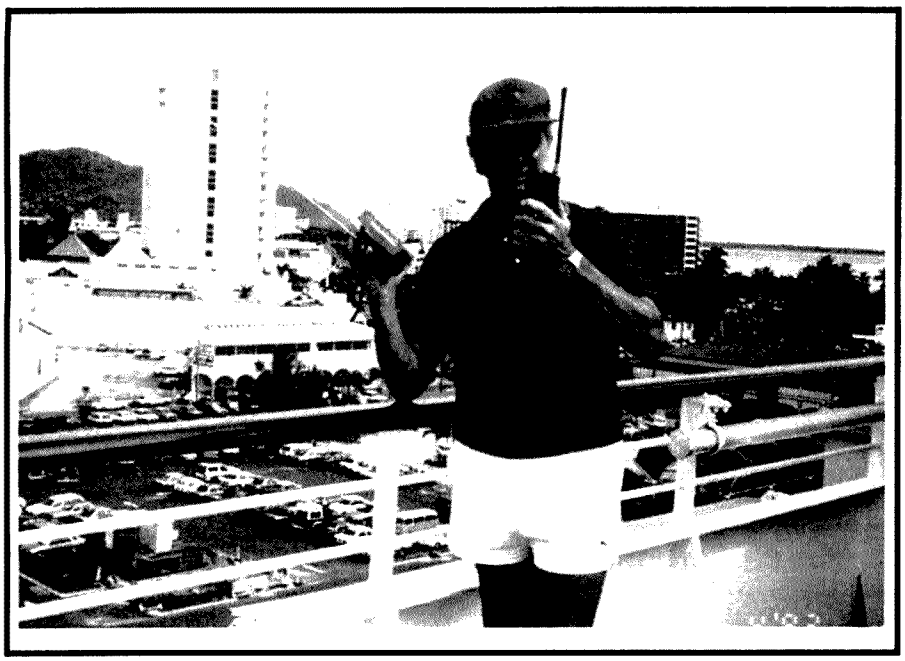
Scanning the repeater lists, Cairns would be next, and up popped Ron with the appropriate call VK4 Electro Motive Force, followed by John VK4VKL.

As we were walking to the post office my handheld burst into life — "Where are you?" it commanded. "Stay there, I'm on my way." John Roberts VK4TL ex VS6CW came running across the road. John had been a friend of my brother Stan (the original VS6DA) and Lyell VK2BE (VS6BE) in the early days of SSB in Hong Kong. How delightful that, through the medium of ham radio and the Cairns repeater, we should meet up — even the XYL was impressed!!

VK4FAB Anne and VK4MP Pat joined in as we sailed off this time, after a wine tasting in the sea terminal (.05 in charge of a moving ham station?).

Our next series of contacts would be offshore as we cruised along yet more of this incredibly beautiful coastline. Through Townsville we met VK4MWT Tom and VK4MUJ Jean, Noel VK4BVD ushered us on to Bowen, where it happened to be VK4CKC Keith's birthday and the repeater echoed with the strains of the traditional song, sung by

Mini-hamfest on board. Left to right: Geoff VK6XB, Alan VE7BSC, Bill N6LAD, Dick KT6X and Eph W2SIU.



The author, Geoff VK6XB-VS6DA-G3ZNV, with the Sony receiver to listen to the 14 MHz net, and the ICOM handheld.

shipboard ham "sirens" as in the days of Ulysses — so much so, that crane driver Geoff VK4JFU almost fell off his perch, and only regained stability by concentrating on questions about the "talent" on board ("you lucky b....s!").

On to Mackay and Wal VK4AIV

Now it was the turn of Brisbane and an early morning contact with Jack and Alma VK4VAS and 4YC, then 4ZEL Mai and 4ZQ Roy, who alerted old friends 4EKK Drake (VS6EK) and 4LC Bill. Brisbane was special for us, as the parents of our son-in-law live at Moogerah, and they came into town to meet us, so we went QRT to enjoy a family day of "bugs" and wine. As we sailed out to the fragrance of the meat processing plant, the Gold Coast repeater kept us company throughout the evening and into the next morning, with old "Sydneyite" Con VK4UZ and Peter VK2EVB. Byron Bay produced Ken VK2DGT, and Coffs Harbour 2PHY Allan, 2YLO John and 2GTM Tracy.

As we sailed into the morning magnificence of Sydney Harbour, VK2UNI Miriam was the last contact from our faithful and sturdy craft, and the handheld became a landlubber again.

To all who added even more pleasure to an already delightful voyage, we thank you. With the help of Sean VK2THT who lent the Callbook, you should all have received a postcard of the ship confirming the QSO. What else can we say, other than it sure beats the hell out of sending messages in bottles.

About the author

Geoff Green retired last year after spending 25 years in Hong Kong as a pilot with Cathay Pacific Airways, and still operates from his QTH there as VS6DA. In the '70s, the airline commenced a service to Perth, Western Australia, and Geoff was able to meet many of the VK6s with whom he had spoken over the years. As a result, Geoff, also a hot-air balloon enthusiast, chose WA to attempt many balloon records and, in 1980, gained the world distance record for hot-air balloons (and a place in The Guinness Book of Records). He also became VK6XB (at times Balloon Mobile!).

With more than 20,000 flying hours, Geoff has now exchanged his 747 for his other flying love, his vintage biplanes. In England he flies his Tiger Moth and a 1937 Hornet Moth. His UK call is G3ZNV.

The "morning net" between VK and VS6 continues to this day, and you will find it on 14.235 at 2330 GMT on weekdays, and a half-hour later at weekends.

* *Lot 1728 DD 221, Sha Ha, Sai Kung NT, Hong Kong*

ar

WIA News

Quarterly Council mooting

As this issue of *Amateur Radio* is being prepared for publication, the July quarterly meeting of the Federal Council of the WIA will meet, over the weekend of 17-18 July.

Important items on this meeting's agenda include the continuing revamp of the Federal company's Memorandum and Articles of Association — which particularly focuses on the structure of the Federal WIA, restaffing of the Federal Office, future editorial and production arrangements for Amateur Radio magazine, and preliminary considerations for the coming year's budget.

Congratulations, Bruce Bathols

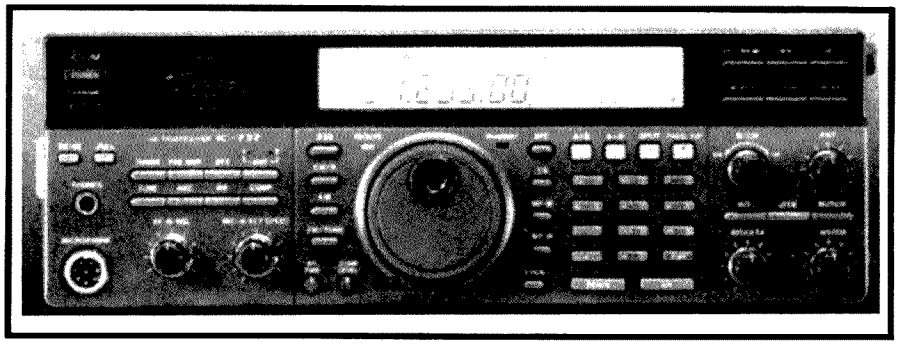
Congratulations are in order for Bruce Bathols VK3UV, production editor of the WIA's *Amateur Radio* for the past year, who has gained the position of editor at Amateur Radio Action magazine.

The best wishes from us, Bruce. We're sure you'll do a superlative job for ARA with fresh ideas and a new perspective, just as you did during your time with AR.

Have you advised SMA of your new address

EQUIPMENT REVIEW
ICOM IC-737 HF All Band All Mode Transceiver

Ron Fisher VK30M checks out the newest medium priced rig from ICOM.*



The new ICOM IC-737 is the first ICOM 12 volt powered transceiver to incorporate an automatic antenna tuner. However, its features don't start or end with this. I would describe the IC-737 as the rig with the super memory system. In this respect alone, it leaves most of its contemporaries in the shade. Just where to place the IC-737 into the scheme of things is a bit more difficult. Is it designed for mobile use or is it a new dedicated base station? I must admit that I am not sure. Over the course of this review I will describe all its features and let you be the judge.

IC-737 Features and Facilities

At first sight I was rather surprised at the size of the transceiver. It is actually 24 mm wider than the old IC-751 although the height is 4 mm less. Overall dimensions are 330 mm wide, 111 mm high and 285 mm deep. In actual volume this is slightly less than the IC-751. Of course we have to make allowance for the built-in antenna tuner but then it doesn't have provision for an inbuilt AC power supply as in the IC-751.

The IC-737 is also jet black in colour. Quite a startling change from the old ICOM colour scheme. I think it looks great. The LCD multi purpose display is the largest and most readable that I have ever seen. The main frequency display numerals are just over one cm high. The rear illumination is bright orange in colour. In contrast the "S" meter is rather dull and hard to read. The display intensity can be adjusted by an internal preset control, but only down, not up.

So much for appearance, let's see what the IC-737 does. The transmitter covers all amateur bands from 160 to 10 metres. The receiver has full general coverage from 30 kHz to 30 MHz (guaranteed range is 500 kHz to 29.995 MHz). Operating modes are SSB, CW, AM and FM. The standard transceiver has three filters, a 2.1 kHz for SSB, a 6 kHz for AM and 12 kHz for FM. Four narrow CW filters are offered as options.

Two operating at 455 kHz give either 500 or 250 Hz band width and two for the 9 MHz IF give the same widths here. ICOM recommend that either one or two of the same band width should be installed. They were not included in our review transceiver so I am unable to comment on their performance.

Of course the IC-737 includes most of the essential features of a 1990s transceiver. Let's run through the list. On the receiver side, there is a switchable preamp plus a 20 dB attenuator. There is fast and slow AGC selection but no provision to switch the AGC off. Also there is no RF gain control. On the QRM management side of things, there is bandpass tuning and a notch filter. The latter is of the audio type as distinct from the more up market IF type but, as we will later see, it is most effective. Tuning has the usual ICOM smoothness. The actual tuning knob seems to be similar to the one used on the top line IC-765 and 781. Normal tuning rate is in 10 Hz steps which gives a tuning rate of 2 kHz per knob revolution. However, if you find this too slow, the stepping rate can be changed to either 20 or 50 Hz. The tuning rate is then four and ten kHz per knob revolution. In a similar way, the one kHz stepping rate initiated by the "TS" button can be programmed to any required step. For instance, a 9 kHz rate can be selected for broadcast band tuning. The tuning rate also changes with the receiving mode. This is ten Hz steps for SSB and CW and 1 kHz steps for AM and FM. However, 10 Hz, or whatever minimum has been selected, can be chosen for AM and FM by giving the "TS" button a push. Of course the IC-737 uses ICOM's superb direct digital synthesiser system which gives remarkably clean tuning. The lack of clicks and plops is noticeable after using older equipment.

On the transmit side the automatic antenna tuner covers all amateur bands including 160 metres and offers high speed tuning. A brand new feature is the provision of two antenna connectors. Two antennas can either be selected by a front panel switch or antennas can be automatically selected by the

transceiver band selection. A very neat idea.

The transmitter includes a speech compressor to add some bite to the signal. This has a front panel level control but there is no metering to get this right. On the subject of metering you get a choice of two readings only, "S" meter and relative power output. Nothing else. Actually, the red LED transmit indicator blinks with SSB modulation to indicate ALC action.

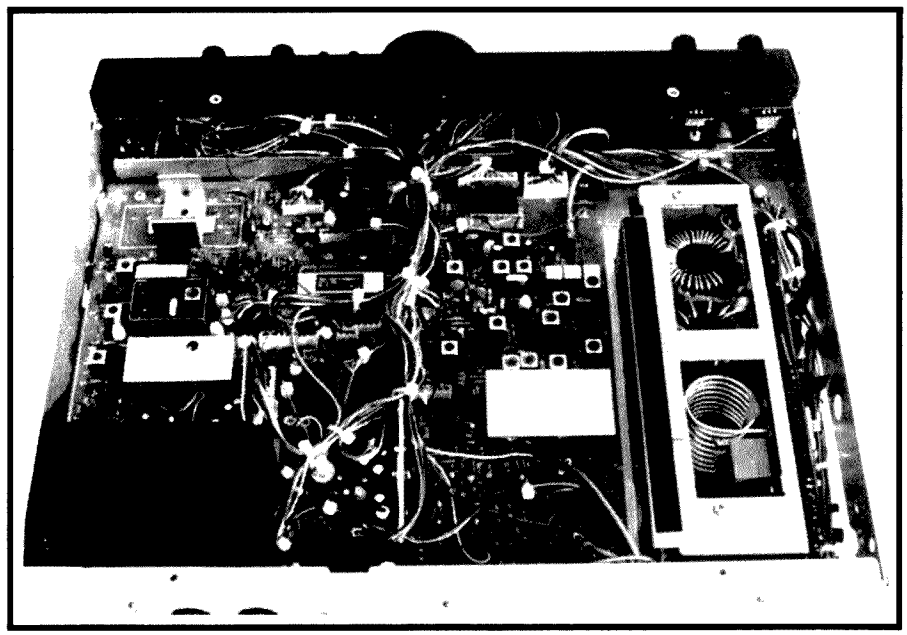
No VOX is included for SSB. However, the CW operator has been provided with an excellent full break in system. Really the only thing missing for the CW fan is an RF gain control and the ability to switch off the AGC. There is even an electronic keyer built in with speed control on the front panel.

Leaving the best to last, the memory system on the IC-737 is outstanding. There are 101 primary memory channels with recall via a dedicated rotary front panel control. But it doesn't end there. A separate "quick" memory gives another ten "Memo pads" These are for the contest operator to quickly pop in stations to be worked in order. ICOM's band stacking register has been refined and now gives two frequencies on each band when the "Band" button is pushed. It actually works out at 124 memory channels. That will take a bit of beating.

IC-737 On The Air

All of the on air and technical tests were carried out using a matching ICOM PS-15 power supply. The AC power to this is switched from the transceiver "power" switch. The power supply cannot be operated in any other way and no auxiliary DC output terminals are provided. My PS-15 has been modified to overcome both of these problems.

Initial tests on receive showed that the IC-737 has an excellent receiver. It is quiet and the signals "jump out at you'. However, there are several parameters that should be set on initial switch-on. These include, "beep" on or off, one kHz tuning step for AM and FM on or off, (revert to 10 Hz steps). RIT and XIT range selectable +/–1.25 or 2.5 kHz. Scan resume setting allows the scan to stop for ten seconds on a signal or to stop scan altogether when a signal is found. Scan speed can be selected, high or low. Antenna selector may be switched on or off or operated automatically via the band switch. There are thirteen items that can be set in a similar manner. The setting procedure is simple. You hold down two buttons while powering up the transceiver, select the item with the up/down buttons and make your choice with the tuning control.



The main circuit board of the IC-737 with the bottom cover removed. The bracket at the top left takes the 455 kHz CW filter. Both CW filters plug in, soldering not needed.

Back to the receiver. Frequency selection is comprehensive. Use the tuning knob (very smooth) with selectable steps of 10 Hz, 20 Hz or 50 Hz. Use the key pad to the right of the tuning control to enter your required frequency or select an amateur band direct from the same keypad with a single push. The up/down buttons on the transceiver step the tuning in one MHz "chunks" while the up/down buttons on the microphone step the tuning in 50 Hz steps. The main frequency display reads out to 10 Hz and, with the "Split" button, the frequency in the other VFO is also displayed. A very neat idea but with one slight disadvantage. The RIT/XIT readout disappears.

On the subject of RIT, when it is there, it reads out to 10 Hz. Very good, but the main frequency display stays put. I note when changing from upper to lower sideband that the frequency does not change. This is as it should be, but it took ICOM a long time to get around to this. The older rigs changed frequency by 3 kHz and no one ever seemed to be able to tell me why!

Received audio quality through the internal speaker was only fair. The internal speaker is only 55 mm in diameter. With my normal external speaker connected, the audio came to life and it was left connected for all of the remaining tests. The subjective sensitivity appeared excellent but the "S" meter was sluggish with the preamp switched out and almost totally inactive with the attenuator switched in. I think, in fact, that 20 dB attenuation is too much. With only a single attenuator setting, 10 dB would be a better figure. In fact, I found the receiver front end was almost "bomb proof" and the only time I needed to switch out the preamp, let alone switch in the attenuator, was on 80 metres at night.

Unfortunately, there is no RF gain control on the IC-737 so you have to rely on the effectiveness of the AGC. In general this performed very well but the slow decay time was too fast. Again, I suggest that RF gain take the place of the squelch control and that this be relocated as a minor front panel control. AM signals sounded

very clean but with rather limited top audio response. I must admit that ICOM have improved their AM reception quality over the last few years but they still have a little way to go.

No optional filters are offered for either SSB or AM reception. The band pass tuning worked well for SSB and I gather it can be used on CW if two CW narrow filters are installed. The notch filter was effective although the overall audio level appeared to drop when it was switched in (see test section). The notch operates in the receiver audio section and while it only removes the effect and not the cause it is none the less effective. Audio notch filters affect the audio quality much less than the IF types which seem usually to have a wide hole at the top of the notch.

Received audio power output was satisfactory, but tests showed that almost double the power is available with a four ohm load. If you intend to use the rig mobile, look for a four ohm extension speaker. It might make a worthwhile difference.

Transmitter tests were carried out using an HM-12 microphone. This was supplied with the rig in place of the specified HM-36. I am told that they have identical features.

Reports showed that the SSB quality was very intelligible but not startlingly good quality. Reports indicated a lack of low frequency response. I tried an SM-6 desk microphone and this was reported as sounding smoother but still lacking low frequencies.

The speech compressor was effective and added a worthwhile bite to the signal.

The transmitted wave form looked good on the scope and the usual tests for intermodulation distortion showed a slightly better than average result for a 12 volt powered rig. The speech compressor was effective and added a worthwhile bite to the signal without adding any noticeable distortion. There was plenty of microphone gain both with and without the compressor; most of the time the microphone gain was no higher than the 9 o'clock position.

AM and FM modulation were checked and found to be satisfactory. Again the quality was reported as very sharp and lacking low frequencies.

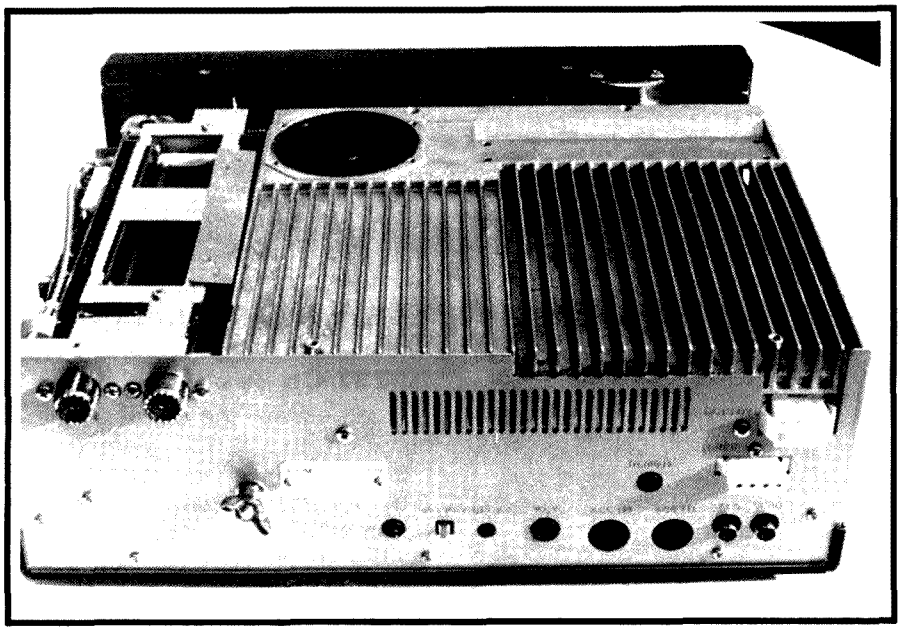
On CW, the IC-737 keyed smoothly with no reported clicks. The in-built keyer was not tested but the manual states it has a speed range of 7 to 41 wpm.

IC-737 On Test

I carried out the usual series of tests on the IC-737 starting with transmitter power output and current drain for both transmit and receive. Power output is variable on all modes via the small "RF PWR" control.

Power Output CW Mode

Band	Power out
160	105 watts
80	105 watts
40	105 watts
30	105 watts
20	100 watts
18	100 watts
15	100 watts
13	100 watts
10	95 watts.



The uncluttered rear panel and extensive heat sink of the IC-737 — note the two SO-239 antenna connectors.

Power output in the AM mode was spot on 40 watts on all bands. Minimum power for all bands was about 8 watts.

It was noted while doing these tests that the relative output indication on the meter calibrated in % output was, in fact, spot on at the 100 and 50 points but seemed to be rather vague at the 25 and 10 points. Current drain on receive was 1.5 amps with no audio output and 1.8 amps with maximum audio output. On transmit with full CW power output the current drain was 19 amps. All of these tests were carried out using a 13.8 volt regulated supply. PEP output in the SSB mode was slightly more than the above figures.

The IC-737 specification does not give a figure for intermodulation distortion, so the same tests as were carried out on the TS-50 (AR June 93, page 19) were tried. We came up with a figure of -27 dB which is reasonable for a 12 volt powered solid state transceiver. For comparison, a mobile type transceiver which I frequently use in my shack came up about 3 dB worse than the IC-737.

Receiver Tests

Firstly, the "S" meter calibration was checked.

Preamp out			Preamp in		
S	1	5 μV	S	1	1.5 μV
	2	6 μV		2	1.8 μV
	3	7 μV		3	2.0 μV
	4	9 μV		4	2.6 μV
	5	12 μV		5	3.4 μV
	8	30 μV		8	10 μV
	9	51 μV		9	15 μV
	+20	400 μV		+20	120 μV
	+40	4 mV		+40	1 mV
	+60	40 mV		+60	10 mV

These test were carried out on 14.2 MHz in the USB mode.

The meter calibration was again checked. In the FM mode on 29.5 MHz.

Preamp out			Preamp in		
S	9	1.8 μV	S	9	.5 μV
	+60	5.0 μV		+60	1.5 μV

In other words, the S meter reads full scale on any but the weakest signals. The attenuator was measured at −20 dB.

AGC threshold was about 1 μV and increasing the RF output of my signal generator to maximum increased the audio output by only .5 dB. AGC decay time from S9 was about 1.5 seconds with "slow" selected and about .5 seconds with "fast" selected.

Receiver sensitivity was measured in the SSB mode at 14.2 MHz with the preamp in. I found it to be 0.16 μV for 8 dB SINAD. This is 2 dB less than the specified figure. On the other hand, the AM sensitivity bettered the specified figure by a wide margin. At 2 μV I measured 14 dB SINAD as against the specified 10 dB. The FM sensitivity was measured at 29.5 MHz. It was 0.5 μV for 14 dB SINAD, bettering the specification by 2 dB. The squelch threshold on SSB was 1.6 μV and on FM 0.1 μV. Just as a point of interest, the sensitivity was checked at 500 kHz and 50 kHz in the AM mode. It was 4 μV and 250 μV for 10 dB SINAD respectively. Sensitivity was +/− 1 dB from 1.8 to 30 MHz.

An audio output meter was connected to the external speaker socket and power and distortion were checked. The specified load impedance is 8 ohms but tests were also carried out with a 4 ohm load. At 8 ohms maximum output was 2.5 watts, a fraction less than the specified 2.6 watts. However, distortion was 25% at 2.5 watts. It dropped to 10% at 2 watts. Distortion on SSB, 1 kHz tone at 250 milliwatts was 1.5%. With a 4 ohm load maximum output increased to 3.9 watts and 2 watts power was delivered with a very creditable 2% distortion. An RF input to the receiver of 0.7 μV was needed to produce maximum audio output.

The audio frequency response on SSB was checked. The -6 dB points were at 150 Hz and 2.5 kHz. 2.75 kHz was -8 dB. The curve was very smooth with a gradual roll off at the high end starting at about 1.5 kHz. There was a slight difference in the response between USB and LSB possibly due to the setting of respective carrier oscillators.

I next measured the effectiveness of the notch filter. The first thing noted was the overall audio level dropped 6 dB when the filter was switched in. However, it produced an excellent notch of -23 dB at 1 kHz and -29 dB at 2 kHz. The actual notch was quite narrow and had only a minimal effect on the audio quality. However, the 6 dB reduction in audio output with the filter selected was disturbing.

Next, the overall selectivity was measured for SSB and AM. The SSB measurement was 2.4 kHz for -6 dB and 4.2 kHz at -60 dB. This is 200 Hz wider than the specification but my measuring technique could well

account for this difference. The AM band width at -6 dB was 5.3 kHz with the -10 dB points at 3 kHz. This is a little narrower than the specification. The -40 dB bandwidth came in at 15 kHz, quite a bit sharper than the specified 20 kHz. In spite of this, AM quality sounded quite reasonable, obviously lacking in high frequency response but clean none the less.

Finally, I did an extended test on frequency stability and readout accuracy. Over a test running for several hours, the drift did not exceed 70 Hz. If you need something better than this, then the optional CR-282 high stability master oscillator might be just what you need. Overall, the technical tests confirm the excellent performance of the IC-737.

IC-737 Instruction Manual

The IC-737 instruction book is a sixty page, A4 size book. It seems that 60 pages are ideal to describe the operation of a modern amateur transceiver as other manufacturers seem to run to exactly the same size.

However, the ICOM manual steals a march on many others in that there are two excellent photos that give the positions of most of the necessary adjustment points. These include such things as the BFO frequency adjustments, the S meter S9 and full scale setting points. Also the minimum power adjust point is identified. I didn't try it, but guess it might be possible to bring the power down to genuine QRP levels. The contents of the manual include panel description, installation and connections, basic operation, function operation, memory channels, scans, maintenance and adjustment, options installation, troubleshooting, inside views, specifications and options. As usual there is no technical description. I would score the manual eight out of ten.

IC-737 Conclusions

Since starting to write this review, I have come to the conclusion that the IC-737 is really a base station with the option of using it mobile if you have a car with the room to fit it in. The excellent memory system makes it superb for amateurs who like to jump from band to band and chasing contacts in band packing contests. Pity I will have returned the rig to ICOM before the RD contest.

The overall performance on both transmit and receive is very good indeed but it lacks a few features that would make it into a top flight performer. Just how it fits into the current ICOM line up is another question. Is it designed to take the place of, say, the IC-735?

As far as the amateur market is concerned, I think it is. Of course the 735 is still a big seller for ICOM but not to amateurs. The Chinese Government will buy as many 735s as ICOM can produce and uses them for military communications, not necessarily on the amateur bands of course.

This then leaves the IC-728/729 for mobile operation and the IC-737 as a lower priced base station. This raises two questions. Will ICOM bring out a six metre version of the 737, perhaps called the IC-739? Next will they bring out a version of the IC-728 with a built in automatic antenna tuner? Unfortunately, my crystal ball has gone hazy so I cannot say!

Back to the present. The IC-737 is of course compatible with the wonderful line up of ICOM options such as external antenna tuners, mobile antennas, linear amplifiers and such. The IC-737 is priced at $2613.18 and this includes the built-in automatic antenna tuner. The optional CW filters are $237.80 for the 455 kHz 500 and 250 Hz units and $139.20 and $116 for the 9 MHz 500 and 250 Hz units respectively. Matching external speakers range in price from $69.60 to $214.60 for the SP-20 with built in switchable audio filters.

Three power supplies are available for the IC-737. The PS-15 at $440.80, the PS-30 at $800.40 and the PS-55 at $522.00. As far as I can see, none matches the IC-737 from the point of colour and size. Unfortunately, ICOM give very little detailed information on their options . The IC-737 is certainly recommended as an excellent performing transceiver. It has enough features to please most operators. My thanks to ICOM (Australia Pty. Ltd) and in particular to Duncan Baxter who kindly came down from "Ham Heaven" to arrange the loan of this transceiver.

* *"Gaalanungah', 24 Sugarloaf Road, Beaconsfield Upper, VIC 3808*

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of June 1993.

L30852	MR B G J WHITTLE
L30854	MR A RAUS
L31285	MR W FRANDSEN
L40350	MR R F HEWITT
L50302	MR T N BROWNLOW
VK3DOS	MR H BIGGELAAR
VK3MHP	MR D BICKERDIKE
VK3PA	MR A GREENING
VK3TQ	MR P R WILLMOTT
VK3ZVT	MR D THOMAS
VK4AYN	MR A E JOHNSON
VK4NBG	MR B J TRAVERS
VK4UQ	MR C RUFUS
VK6FHP	MR F H PHILSON
VK6YMB	MR M W BRAND
VK8ZAB	MR A D BAKER

VOLUNTEERS WANTED TO READ *AMATEUR RADIO* FOR THE BLIND

The Royal Victorian Institute for the Blind needs volunteer readers with a strong background and/or interest in radiocommunication to record *Amateur Radio* magazine on tape for the blind and print handicapped.

You don't need to be Laurence Olivier or Vanessa Redgrave, but you do need

- a clear, pleasant voice
- the ability to read aloud fluently
- a regular commitment of 3-6 hours per week
- a willingness to undertake a short training course

All enquiries to:

Shaun McCarthy
Co-ordinator of Narrators
Royal Victorian Institute for the Blind
85 High Street
Prahran VIC 3181
Tel: 521 3400

Technical Abstracts

Gil Sones VK3AUI

160 Metre AM Transmitter

A 2 Watt 160 Metre AM transmitter which generates AM by filtering a Pulse Width Modulated signal is described in the Rad Com May 1993 issue by Peter Asquith G4ENA. The technique used provides a simple low power AM transmitter on a printed circuit board without the need for the usual modulation transformer. The design is intended for the hidden transmitter in hidden transmitter hunts. However, it may have wider appeal as an AM transmitter for local contacts.

The circuit is shown in Fig 1. The audio amplifier stages have a peak limiter and audio filtering to control peak modulation and limit the bandwidth. RV1 sets the peak audio level. RV2 sets the modulation depth.

A hex inverter is used as the oscillator and driver. R12 and C10 convert the square wave from the oscillator into a triangular wave. The DC bias from RV3 sets the threshold point at IC2a. The audio varies this threshold point producing a PWM output. At full power and full positive modulation the output of IC2c and IC2d will be a square wave of 50:50 mark to space ratio. At standing carrier level with no modulation the mark space ratio should be 25:75. At the modulation negative peak the mark space ratio is 0:100. A little fiddling with the pots will result in close to 100% modulation.

The square wave PWM signal drives a logic level input VMOS power FET. L3 can generate spikes and D5 is used to catch any negative pulses. The signal is then filtered by a 7 pole low pass filter which attenuates unwanted harmonics.

The whole transmitter was built on a 100 mm by 50 mm PCB . However, other construction methods could be used. The diode D5 must be a fast recovery type as it has to work in the megahertz region.

The coil winding details for the filter are as follows :-

L3 4μ5 H. 33 turns 0.315 mm Cu wire on Amidon T37-2 toroid.

L4,6 5μ45 H 36 turns 0.315 mm Cu wire on Amidon T37-2 toroid.

L5 6μ9 H 41 turns 0.315 mm Cu wire on Amidon T37-2 toroid.

The 0.315 mm wire is 30 SWG and any wire close to this should do.

Also in the same issue of Rad Com by the same author is a rather neat DF receiver which uses a PCB loop. The receiver circuitry is inside the loop on the same PCB rather like the old portable radios which had the loop aerial wound around the cabinet.

If anyone likes to experiment the receiver loop had about 12 turns around the periphery of a PCB sized 240 mm by 200 mm.

CW Offset Indicator

CW operating with both stations on the same frequency requires some skill with many transceivers. Later designs make life a bit easier by having the sidetone at the same frequency that the beat note of the incoming signal should be. However, older designs, and for those older hams who find it difficult to match the pitch, it can still make for difficulty.

Recently both 73 magazine and the JA CQ magazine have carried designs for a simple tuning aid which lights an LED when the desired pitch is achieved. The 73 Amateur Radio design appeared in the October 1990 edition in an article by F A Bartlett W6OWP. The JA CQ article appeared in March 1993 in an article by JA9MRU.

Both use an LM567 Integrated Circuit which is a Phase Lock Loop IC to drive an LED when the incoming audio from the transceiver is at the same frequency as the PLL. The circuit is tuned to the CW offset frequency which may be the same as the sidetone frequency. If the offset is not the same then the handbook may help or some tests may be needed to find the beat note tone frequency which results when you are on the same frequency as the station that you are working.

Once found, and the LM567 frequency has been set, you only need to tune to light the LED to be zero beat with a station.

The circuit is shown in Fig 2. If the 78L06 regulator is hard to find then try a 5 volt one or a 9 volt one. The important thing is to have a stable voltage so tuning does not wander.

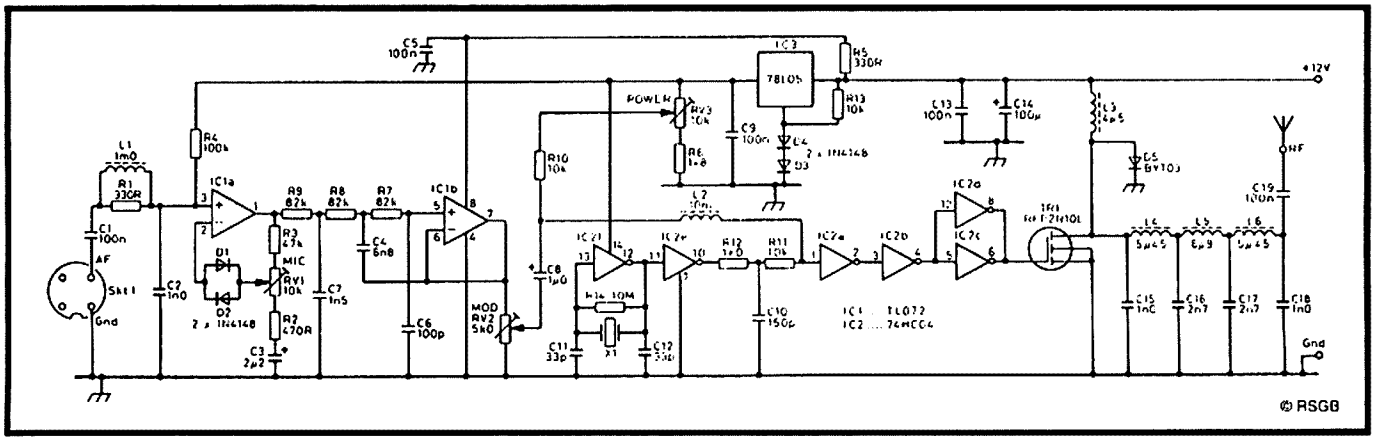


Fig 1: Pulse width modulation is used for the DF transmitter, which has an output of about 2 watts.

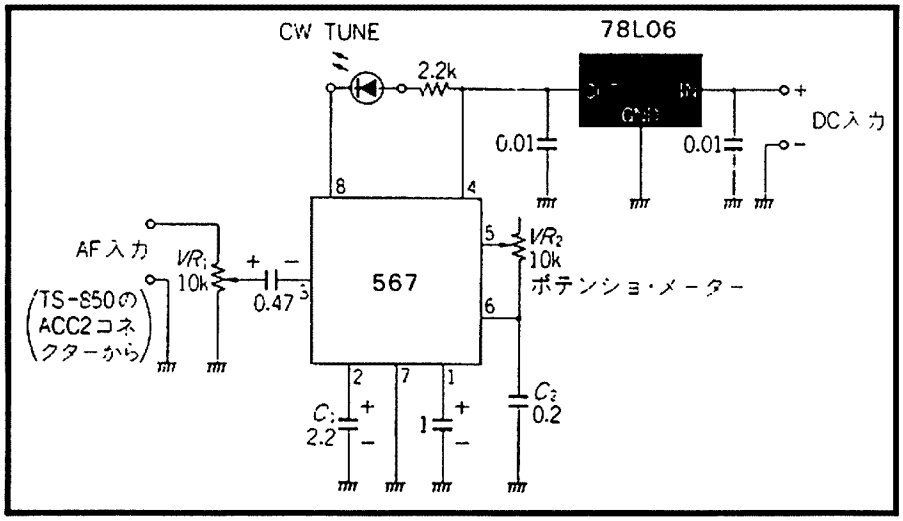


Fig 2. CW Tuning Aid.

Salvaging Surplus Components

Many printed circuit boards full of choice bits are discarded as the cost of repair is often greater than the cost of a new board. The problem is how to recover the choice bits without destroying them.

Conventional desoldering techniques often result in the loss of many parts. This is especially true of Integrated Circuits and Surface Mount Devices. The problem is how to melt the solder on all leads at once so that the component can be lifted. Unequal heating and levering usually results in losses. Fancy desolder stations can do better but you might just as well have bought new bits due to their cost.

A technique for desoldering PCB's appears from time to time which has some merit even though it appears brutal and can be hazardous. I first encountered this method in an early form which cannot be recommended due to the hazards involved. The board was heated with a gas torch to melt the solder and then given a smart rap. Bits and molten solder flew! Hazardous, to say the least. However, a suitably skilled and attired operator could achieve quite a good recovery rate. **Don't try to emulate this technique.** Goggles and full skin cover clothing such as used when welding are essential. The flying solder is very dangerous.

A new version has appeared which minimises the hazards, although molten solder and heaters must still be treated with respect. In particular, wear top quality safety eye protection. Also wear long sleeved and full leg and torso covering heavy duty clothing together with stout footwear. Just one drop of molten solder can be dangerous and most uncomfortable.

The new technique is derived from the equipment used to work with SMD components. A hot air stream is used to melt the solder. For SMD work this source of hot air is a fancy solder station. However, for less precise work such as stripping PCBs there are other ways.

In 73 Magazine for April 1993, C L Houghton WB6IGP in the "Above and Beyond" column shows how to use a Hot Air Paint Stripper Gun as the heat source. These devices enable you to have a controllable source of very hot air. They are widely sold in hardware shops.

The PCB is clamped in a vice which leaves you with both hands free. You use one hand to operate the hot air gun and with the other hand prise the bits free with the prising device of your choice. The gun melts the solder over a localised area of the board containing the parts you want. Most bits can stand the heat for a short time. The trick is to use enough heat quickly to remove them without damage.

The technique succeeds because the bits are only heated for a short time. The PCB will be rather a mess but it was a throwaway anyway. Some practice runs are in order before tackling anything where you really want particular bits.

Remember to wear eye protection and to wear durable clothing covering limbs and torso together with stout footwear. While the method minimises the chance of hot solder and components flying about there is still danger. The hot air gun, whilst relatively civilised, should be treated with respect as it could cause a nasty burn. ar

WIA News

New arrangements in Russia

The **Krenkel Central Radio Club of the Russian Federation** has taken over the role of the former Radio Sport Federation of the USSR.

It now administers the PO Box 88, Moscow, QSL bureau operations, as well as arranging contests, competitions, exhibitions and DX-peditions, so a recent letter to the WIA Federal Office under the signature of V. Bondarenko UV3BW, explains.

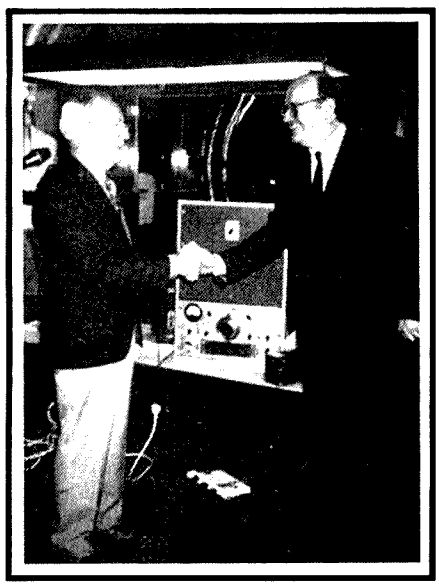
The Story of Kingsley Radio Pty Ltd, 1938 to 1945 Part 3

*George W Neilson VK3TES * concludes his most interesting story of the Kingsley Radio receiver, the AR7.*

The Army asked us to modify an Aust Reception Set No 1 to use for direction finding. I did most of the design of this modification and in addition due to the pressures of the time and in order not to disrupt the normal daytime routines worked night shift for two weeks to have access to a lathe to manufacture the various parts for the six units which were made. The first model was designed and built and late one afternoon we took it over to the Domain Gardens opposite the factory to carry out trials. Some officer from Victoria Barracks was going home on the tram and saw us. When he got home he phoned the security people and we were subsequently visited by the Military Police. Fortunately we did not wind up in jail.

On one occasion we had a visit from the RAAF about a problem with Morse code reception where the signal was fading out. In the receivers of those days it was necessary when using the BFO to disconnect the AGC and operate under manual gain control. In the "AR7" the signal detector and AGC detector are adjacent in the same valve envelope. When the BFO is coupled into the signal detector it also is detected by the AGC detector and desensitises the receiver. Because of this the AGC is disconnected when the BFO is turned on. We soon found that the problem was caused by the signal becoming too strong, overloading the receiver rather than fading out. The solution was to use Amplified AGC. This is achieved by using a separate channel to amplify and detect the IF signal thus isolating the AGC detector from the signal detector.

A receiver was modified with an out-rigger chassis mounted on the back containing the separate IF amplifier and detector. This modification worked very successfully. There was also some experimentation in diversity reception where two separate receiver systems are paralleled at the signal detector loads. The receiver with the stronger signal biases off the other receiver.



Allan Doble VK3AMD (left) hands over the restored AR7 Kingsley Communication Receiver, to Mr Boyce Piszey, Director of the Scienceworks museum.

The RAAF had numerous receivers at base stations each tuned to the one frequency for continuous listening. They approached us about a crystal controlled local oscillator. Perhaps I am influenced by my Scottish ancestry but I always try to keep designs simple. The replacement crystal controlled oscillator consisted of four components mounted in the oscillator coil box, the Crystal, its socket, a bracket for the socket and a 10K resistor. The crystal was connected directly between the grid and plate connections as a Colpitts oscillator using the stray and valve capacities and the 10K resistor became the anode load. The tuning capacitors were connected to separate connections on each coil box and could be isolated. With this oscillator in an appropriate set of coils the receiver was simply tuned for maximum signal. Worked perfectly! This system of crystal control was also used by the Civil Aviation Department.

The shortage of materials always produced problems. We used a long screw of insulating material, known as Erinoid, a casein material, but it eventually became unavailable. A substitute was found to be knitting needles — one had to be very inventive! The suitable size needle was threaded with a die and then cut into lengths. The threading operation resulted in large amounts of swarf in long curly threads. We in our innocence never thought anything about this and in due course it was gathered up by the cleaner and a large quantity dumped in the incinerator. Unfortunately, knitting needles in those days were made of Cellulose Nitrate and that translates loosely into "GUN COTTON" !! The cleaner lit the incinerator and before he had time to move out of range there was a loud explosion which fortunately only blew the lid off, but must have removed ten years from his life! I reckon people got medals for less on active service.

During 1943 the Government started to contact factories engaged in defence work and asked them to start planning for after the war. It seemed that the end of the war was already anticipated. The decision was made that Kingsley would become involved in the manufacture of coils, IF transformers and tuners. Lay Cranch who had considerable experience at Crown Radio in Sydney with the manufacture of these components, joined the firm, together with his coil designer Laurie Fitzgerald.

As described earlier we were making powdered iron cores for use in the AR7, which used over twenty per set. HK went to America and signed agreements with a man named Polydoroff who held patents on an improved type of iron core. These cores had two important improvements over ours. The raw material was again Haematite to

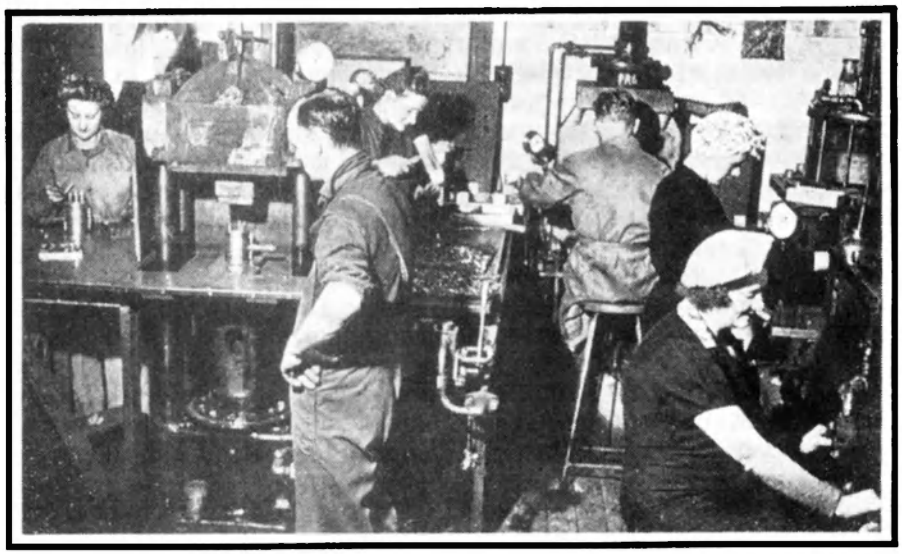
which was added a small quantity of Antimony Oxide which during the reduction process combined with the iron producing an alloy with reduced losses. The milled alloy powder was then given a phosphate coating to prevent the shorting of particles.

We experienced difficulty getting trimmer capacitors. The AR7 used twenty eight in a set of five coil boxes. It was decided that we would have our own capacitor made. We were involved with a manufacturing jeweller in Melbourne, most firms having been switched to war production. Making a variable air type miniature capacitor was a suitable job for them. I had to design the capacitor. In parallel with our iron core production we had been experimenting with making insulators using steatite and the phenol formaldehyde resin. A conventional air trimmer was designed using our insulators. The stator frame was punched from sheet stock to save expensive repetition machining. There was always a problem in the AR7 coil box, the trimmers being hidden so one cannot see as they approach the limits of capacity. A stop was designed into our trimmer at minimum (anticlockwise) or maximum (clockwise) capacity.

It was decided that we would market a tuner for radio receivers using iron cores for tuning instead of the conventional tuning capacitor. I was given the job of designing this unit and a prototype was built for presentation at an exhibition which was held in Sydney. To make maximum impact this unit was made dual wave but the subsequent production model was broadcast only.

I was not given any specification, which was usual in those days. I decided therefore that the unit had to be as good as the equivalent capacitor tuned-unit. HK had brought back from America a small MW receiver using permeability tuning. This had the cheapest and nastiest possible tuner and I vowed that we would never make anything like that.

The biggest problem found was that the non-linear tuning curve caused most of the stations to be crammed up at the HF end. Capacitor units were better, so this was one area which we had to improve. The



Iron Core Production. The heavy core press room at Kingsley Radio Pty Ltd, for production of large shapes and slugs. The smaller cores were produced on high speed automatic presses.

manufacture of iron cores to give a frequency range of three to one or nine to one inductance change in the aerial coil was not easy and required special techniques. To get the required permeability it was necessary to press the cylindrical cores sideways rather than the normal end-on. As the iron particles tend to flatten, sideways pressing caused the particles to lie in the most favourable direction. This tends to preclude any grading of the core similar to the way the plates of the capacitor are shaped. The cross section of the pressed cores cannot be made round because of die problems but were ground round after pressing.

The solution became mechanical and the variable pitch drive screw was devised. For the prototype which went to Sydney a pencil line was drawn on a quarter inch diameter shaft and our toolmaker cut the "Acme" thread with a hacksaw. For the production model a "Hercus" bench lathe was modified to use a cam driven from the lead screw to drive the saddle with a large spring making the return stroke. The cutting tool was fitted with automatic feed and spindles were made in a semi-automatic operation. The pitch of the screw matched the tuning curve of the aerial coil giving linear frequency tuning. As the frequency range of the oscillator was only about two to one conventional cores were used with two different cores combined end on end to give correct oscillator tracking. Adjustable copper tabs were used for low frequency trimming of the inductor with conventional trimmers for the high frequency end. After the war this unit was very popular and sold in large numbers to home builders.

Having become involved in the manufacture of iron powder (some even being sold for medicinal purposes) it was a likely step to move into the manufacture of copper powder for use in porous bronze bearings. A copper powder plant was set up using electrolytic deposition of copper on stainless steel plates. A large low voltage 1500 A rotary generator supplied the power. Suddenly we were involved in using two inch by one inch (5 x 2.5 cm) busbar conductors instead of hook-up wire! We learnt the hard way how not to demagnetise the auxiliary generator supplying the field when shutting it down.

By now we were making numerous kinds of cores including toroids and pot cores. This led to a contract with the then PMG to supply Tone Oscillators for carrier telegraph operation. These were single frequency tone oscillators designed for rack mounting and covered a range of voice frequencies at 240 Hz intervals. They used a pot core with adjustable inner core for tuning.

American aircraft in the area by now were using VHF radio communication around 120 MHz and the RAAF had no matching ground station equipment. A quick fix was to adapt aircraft transceivers — such as the SCR522 set with four switched crystal controlled frequencies — for ground operation. The RAAF technical staff built a prototype mains operated power supply for the SCR522 and specified all the components. We were contracted to make a batch of these and had all the parts supplied to their specifications. The first unit was submitted for inspection by AID — Aeronautical Inspection Directorate. Sadly the power failed, being low in volts. Then started a saga which surprisingly did not end up in the High Court. The transformer manufacturer and the RAAF, with us in the middle, haggled about whether the transformer conformed to the RAAF spec. There were exhortations to use dynamometer voltmeters etc but it transpired that the RAAF had built their prototype using a Variac as the transformer and then measured the voltage, which they then specified. Of course the source impedance of the production transformer in no way compared with the 1 kVA variac!

I left Kingsley when the war finished to run my own business so was not involved in their post war production although I was contracted to make test equipment for their production line.

It was a sad day when, in their post-war prime Howard Kingsley Love passed away. He was the inspiration and driving force of Kingsley Radio Pty Ltd and the shareholders were not prepared to carry on the business without him.

Prior to 1924, Kingsley Love had the amateur call sign 3BM. After the war he obtained the call sign VK3KU.

Vale HK, VK3KU.

Scienceworks (Science Museum Victoria)

In August 1992 Mr. Geoff Holden, curator of Electronics at Scienceworks, which is now located at Spotswood, expressed the wish that the museum could acquire a good example of the justly famous "Kingsley" AR7 communication receiver. This would be held, but not necessarily always on display, as part of the reference collection of uniquely Australian designs and inventions.

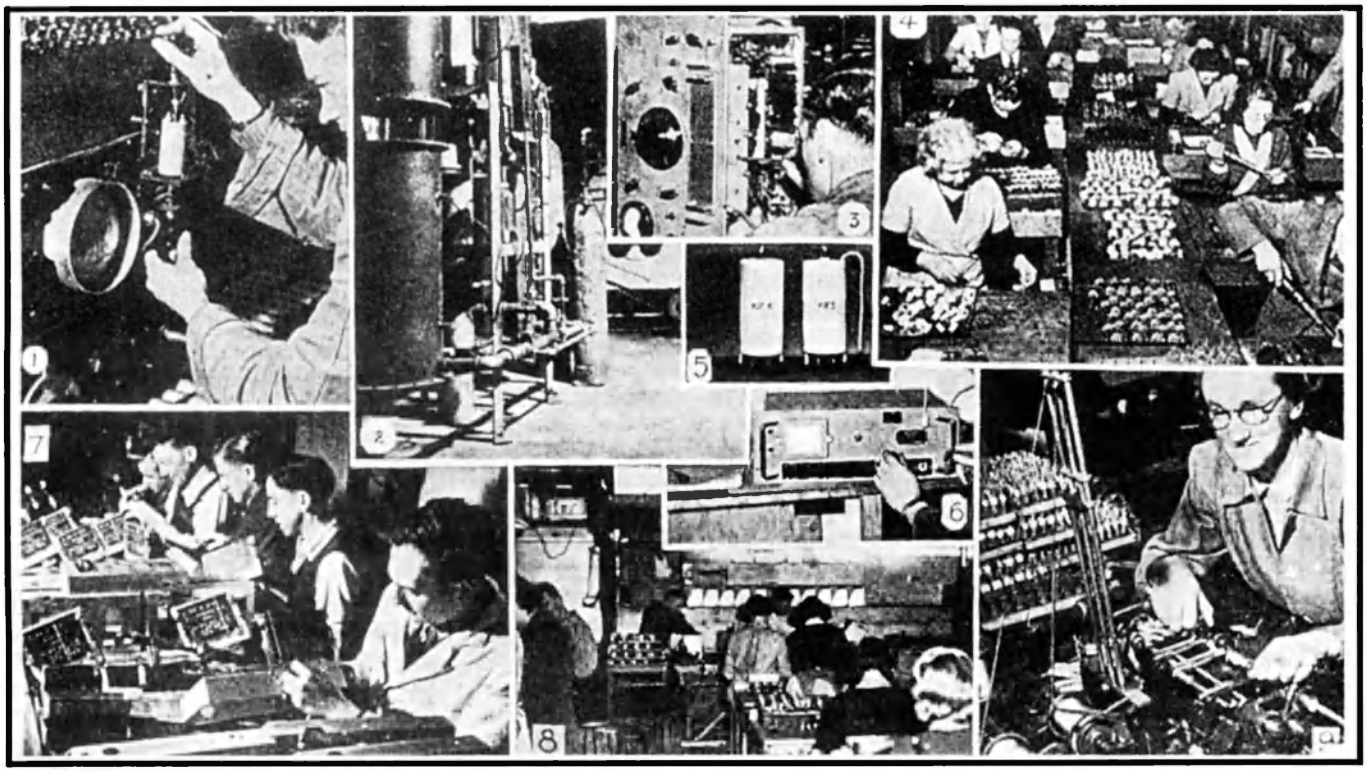
Allan Doble VK3AMD placed a "wanted" advertisement in the September 1992 edition of "Amateur Radio", and received such a generous response that a completely restored and fully operational AR7 was handed over to Mr. Boyce Pizzey, director of the Museum on 25th November 1992.

Major gifts were:

Kevin Judd VK3ZDJ — Power Pack, speaker and rack.
John Beverin VK3CMO — AR7 Receiver.
Bill Trenwith VK3ATW — Coil Boxes.
Lay Cranch VK3CF — Distribution Manual.

Milton Crompton VK3MN and Doug Richards VK3CCY contributed some power pack components.

The hard work was done by Harry Mauger VK3KAE who repaired, cleaned up, painted and tuned up the rig so that it looked like new, and



1. IF testing with FM oscillator and Cathode Ray Oscillograph; 2. Section of Furnace Room for reduction of iron powder; 3. Aligning Kingsley K/CR/11 (AR7) Communications Receiver; 4. Section of one of Kingsley's IF and coil process lines; 5.Typical standard IF transformers; 6. Testing Crystal Calibrator Unit as supplied to RAAF; 7. One section of "Ferrotune" production line; 8. Portion of the Communications Equipment production section; 9. One of the battery of universal precision coil winding machines. ***Photographs from the Kingsley Radio components catalogue. Kindly provided by the estate of the late Lay Cranch, VK3CF.***

worked like new, in fact, at the time of the handover, CW from the Perth coastal station formed a background to the short speeches. All ex RAAF personnel who have seen the receiver have confirmed that the restoration is almost uncanny, a great tribute to Harry Mauger's skill.

Present on the day of the handover were:
Mr Boyce Pizzey and Mr Geoff Holden of the Museum, and a representative group with detailed knowledge of the receiver's manufacture and use.

This group comprised:
George Neilson VK3TES who worked for Kingsley Radio from before the AR7 was born, until after its wartime production of 3,200 sets was completed.

Bill Gronow VK3WG who, as a Wing Commander in the RAAF was responsible for overseeing the production of the RAAF's requirements for radio and radar.

Quintin Foster ex VK6QF who commanded one of the until recently secret RAAF "Wireless Units" whose task was to monitor and translate Japanese armed services traffic using AR7 receivers.

Arthur Evans VK3VQ who commanded another of the RAAF "Wireless Units".

Jack Bleakley who has written the recently published book *The Eavesdroppers,* Australian Government Publishing Service, (Canberra:1992), which details the work of these units and in which both Quintin Foster and Arthur Evans are named.

Harry Mauger VK3KAE who assembled and tested the complete receiver.

Ron Fisher VK3OM who photographed and recorded the proceedings on the day of the handover, and Allan Doble VK3AMD.

Opening the proceedings Boyce Pizzey, director of Scienceworks said what a great pleasure it is to have the "Kingsley Team" bring this particular piece of Australian inventiveness and technological history into the museum. "This is perhaps the first major acquisition we've had since Scienceworks started up, so it's a red letter day for us and as part of the opening of the new Communication Program it's really quite an important event". He thanked all for their contribution, and asked Allan Doble to take us through the story of the Kingsley AR7.

Allan Doble then outlined how Geoff Holden had said Scienceworks would really like a nice working example of the Kingsley AR7 receiver. So it started with an innocent 5 line "wanted" advertisement in *Amateur Radio.* The response was overwhelming. "We couldn't accept all the offers, but we did get a receiver, and powerpack, and coils from a group of people. And a good friend, Harry Mauger, put the whole thing together". He introduced Jack Bleakly, Arthur Evans, Quintin Foster and Harry Mauger. He then invited Bill Gronow who was the RAAF's top man technically for the overview of radio communication and radar requirements for the RAAF, to review the history of the AR7.

Bill Gronow described how signals organisation evolved from a few officers, several NCOs, and devoted airmen, all very interested in radio, but having very little money at their disposal, and very limited equipment. When World War II commenced, 152 members of the Wireless reserve, mainly amateurs, joined up and the Signals Section got off to a good start. In 1928 the RAAF decided to foster local manufacture, and specifications were written for transmitters, receivers, and transceivers and contracts were ultimately placed with local contractors of whom Kingsley Radio was one. He reviewed earlier Australian Radio Receivers, of which there were six, before the AR7 which covered 138 kHz to 25 MHz, and became a very good, locally produced base station receiver.

Allan Doble then formally presented the AR7 to the Museum and commented that it hasn't cost anybody anything except time and work, and it might be seen as a tribute to the wonderful radio industry this country once had, and to the men who used the receiver in very trying conditions.

Boyce Pizzey concluded the proceedings by again expressing his appreciation of the gift.

* *48 Garden Street Blairgowrie Vic 3942*

ar

WIA News

Amateur Radio helps Navy base Celebrate

Canberra RAN club station VK1RAN was given permission to operate mobile from the grounds of the HMAS Harman Naval Communications Station during its 50th Anniversary Open Day on Saturday, 3 July.

Operated by members of the Naval Amateur Radio Society (RNARS), VK1RAN contacted stations around Canberra, in Adelaide, Perth, Sydney — including RNARS station VK2CC at Snapper Island, and Brisbane — including the RNARS station VK4RAN onboard the museum ship, HMAS Diamantina at South Bank.

Several hundred former Navy communications operators and technicians gathered for the 50th anniversary, touring the base during the Open Day.

VK1RAN operators were Peter Ellis VK1KEP, director of RNARS Australia, committee members Glen Dunstan VK1XX and Margaret Nally VK3QU (who travelled from Melbourne for the Anniversary), and Gerry Aubert VK2CGA, from Sydney.

Under the Navy's regulations, the approval for the VK1RAN operation at HMAS Harman came from the top: the Chief of Naval Staff, Vice Admiral Ian MacDougal, on advice from Commanding Officer, Commander George Spence.

The new Spectrum Management Agency approved the temporary mobile operation of the club station away from its normal address.

VK1RAN went to air from a long wire HF antenna sloping 45 degrees from a 30 metre fixed tower, with rigs set up at the side door of a passenger van, parked in the grounds.

Quickie Transistor Checker

*Brian J Field VK6BQN * describes the construction of a very simple transistor checker.*

Almost all parts can be found in the junkbox and none of them are critical. The principle of operation is that the transistor acts as an oscillator using the primary of a low voltage transformer. The secondary (240 V winding) drives a meter to indicate oscillation. If the transistor is a dud nothing happens and the meter doesn't move. Some versions of this device have done away with the meter and use a NE51 neon bulb. I used the meter only because it is more sensitive since a neon requires around 60 V to fire.

The transformer I used was 10-0-10 V but a 6 V or 12 V either side of centre tap should work. The only thing is to make sure there is something on the 240 V winding that can be measured. Use your scope initially to make sure the device oscillates by connecting the probe to the total of the low voltage side and if necessary adjust the value of the 8 μF capacitor to whatever is a suitable value for reliable oscillation.

Once you are sure it is oscillating it is now a matter of getting a meter to indicate. This is best done experimentally depending on the meter sensitivity and the voltage obtained. There are some hefty spikes but since the meter is only going to read average voltage it should be set to about 30 V full scale. Note also that only a single diode rectifier is used so that the average voltage is going to be a lot less than the peaks seen on the scope.

Nothing in the construction is critical. I made a rectangular piece of

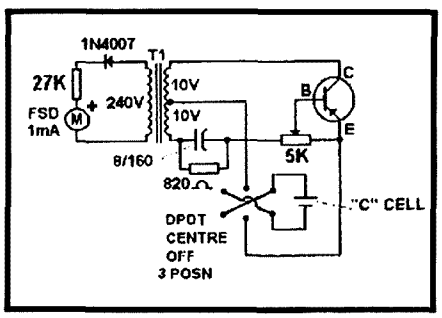


Figure 1 — Schematic Diagram

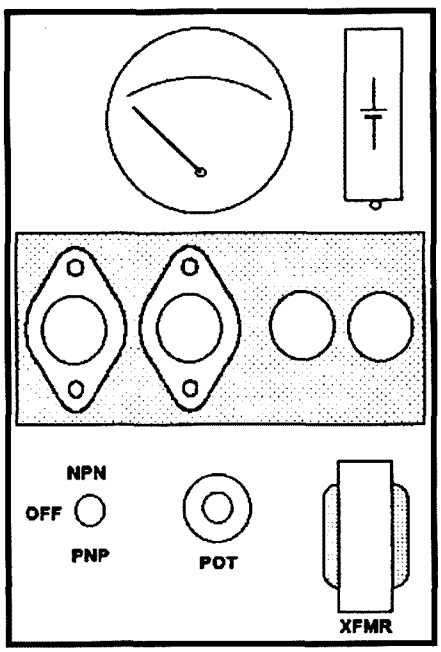


Figure 2 — XRAY View, Front Panel (not to scale)

bakelite to mount the various sockets and cut out the square hole in the panel large enough to clear a TO3 transistor so that nothing touches the case. Mount the sockets for TO3 and TO66 with round head screws so that they will touch the transistor case to make the collector connection. I also reamed out the holes for E and B on these two sockets since they were so nice and snug on brand new devices. Not really amenable to testing devices with solder traces on their pins. The third socket is 3 holes in line for testing TO220 and similar packages. The pinout almost always has the collector in the centre so it doesn't matter which way the other two leads are connected. Alligator clips can be used to cover all contingencies. Finally the switch must have a centre off to avoid draining the battery.

In operation it is merely a matter of plugging in the transistor and twiddling the pot to get it to oscillate. Make sure to hold the case down on power types onto the screws to make contact. Some devices are touchier

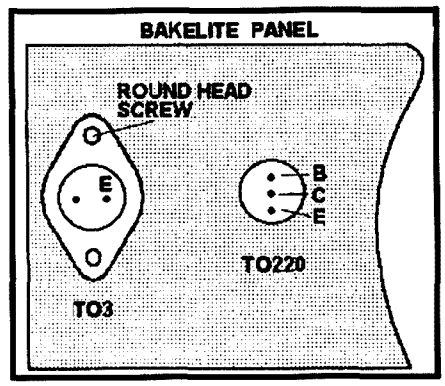


Figure 2A — Location of Power Transistors

than others but most seem to give something over a similar range of rotation. 90% of devices will fit the sockets as shown.

Tech Teacher's Notes

1. *The author used an ordinary electrolytic for the 8μF capacitor. More reliable operation with polarity reversals when switching from NPN to PNP would be obtained with a bipolar or a plastic dielectric capacitor.*
2. *At one extreme of the pot travel the Base Collector junction may be damaged if reverse polarity is applied. The current is limited only by the transformer winding resistance and the internal resistance of the cell. The author has not experienced trouble but the possibility exists.*

Materials List

820 ohm resistor
27K resistor
5K potentiometer
Filament Transformer (must be centre tapped)
Meter
1N4007 Diode
8 μF Capacitor
DPDT centre off switch
C cell
Jiffy Box
Transistor Sockets
Bakelite Strip 100mm X 40mm

* *PO Box 466, Hillarys WA 6025*

ar

Book Review
History of International Broadcasting

By James Wood
Reviewed by Bill Rice VK3ABP
Published December 1992 by the IEE (Number 19 in the series IEE History of Technology) ISBN 0 86341 281 5. 258 pages. Our copy direct from IEE. Price (in UK) 30 pounds sterling.

This is a book which will be of interest to all radio amateurs, since most of us began our radio career as short-wave listeners. Further back in history the very broadcasters to whom we listened were frequently amateur stations before they evolved into larger organisations.

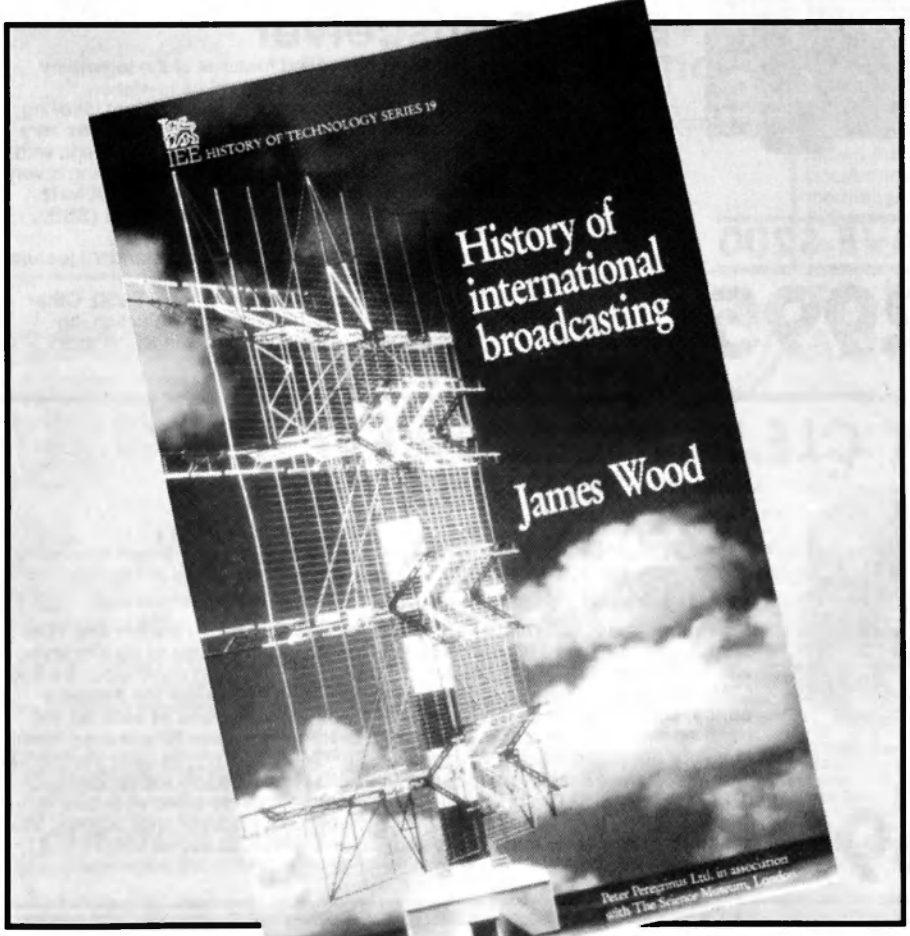
As might be expected of a book published in the UK, the organisation most fully described from its beginnings in 1922 is, of course, the BBC. At the time of publication, the UK was the fifth largest overseas broadcaster, with about one-third the program hours per week (756) of the leading country (USA, with 2368). The USSR was second with 2257 (undoubtedly different now!), China 1517, and the (then) two Germanys 1311 between them. Australia barely rates a mention (in fact, the index has no entry for Radio Australia), but Canada, Switzerland and many others are likewise ignored. These omissions are mentioned apologetically in the preface.

A more surprising omission is of the part played by an amateur (Gerald Marcuse G2NM) in the genesis of BBC short-wave broadcasting in 1927. John Clarricoats' book, "World at their Fingertips", would appear not to have been one of Mr Wood's references!

Apart from occasional diversions into the technology of high power transmitter construction (the author's own field) most of the book covers in excellent detail the evolution of broadcasting (especially HF) as a means of influencing public opinion. While contrasting the initial American emphasis on entertainment with the British use for "social manipulation" (Wood's words), he shows how most countries developed effective broadcast propaganda systems — both political and religious. These played their first part in the Italian invasion of Ethiopia in 1935, evolved tremendously during the war years 1939-45, and probably reached their peak in the Cold War between 1946-1986. Jamming by the USSR of such programs began in 1948 and eventually ceased in 1988 with the collapse of Communism. Wood makes a good case for Western broadcasting propaganda being a significant factor in this event.

And what of the future? An appendix entitled "Television, the Gulf War and the Future of Propaganda" makes reference to "Over the Horizon Television". The sky, it seems, is not the limit!

ar



WIA News

WIA Exam Service Statistics

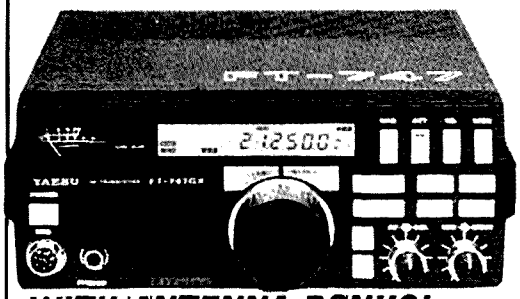
The pass rate at licence examinations rose by almost 11 per cent in the first four months of 1993 compared to the same period last year, while the number of candidates per event fell by nearly 25 per cent and the number of events jumped by over 63 per cent.

During January to April 1992, 111 examination events were held, while 181 were held in the corresponding period this year. There were 477 candidates who sat exams in the those four months of 1992, compared to 584 in the same period of 1993 — a jump of 22.43 per cent.

Similarly, the number of subjects rose in 1993 — 940 subjects this year, compared to 773 last year; a rise of 21.6 per cent. However, the number of candidates per event fell from 4.3 in 1992 to 3.23 in the first four months of this year, a drop of 24.88 per cent.

There was a heartening rise in the pass rate, from 49.03 per cent in 1992 to 59.68 per cent in 1993; an increase of 10.65 per cent. The number of subjects per candidate hardly varied, being 1.62 in 1992's first four months, and 1.61 this year. The number of subjects per event fell from 6.96 to 5.19, or 25.43 per cent.

NOW'S YOUR CHANCE! YAESU PRICES SLASHED!



WITH ANTENNA BONUS!

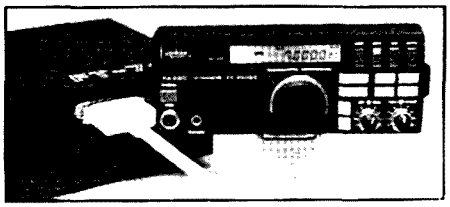
Your choice of 2 'Mobile One' mobile HF antennas from our range of 80m, 40m or 20m whips. Worth Over **$90**

2 Year Warranty

FT-747GX Compact H.F Transceiver

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts PEP output on all 1.8-30MHz amateur bands, and general-coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and an easy-to-read backlit digital display, dual tuning steps for each mode, dual VFO's for split-frequency operation, and 20 memory channels. Wideband 6kHz AM and narrow 500Hz CW IF filters are also a standard feature. Complete with Yaesu MH-1 hand microphone.
Cat D-2930

$1299

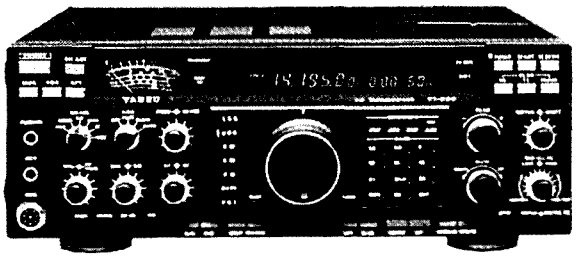


RMK-747 Remote Mounting Kit

This modification kit allows the front panel of the FT-747GX to be mounted away front the body of the transceiver. Price includes installation on your FT-747GX.
Cat D-2931

$349

SAVE $100



FT-990 DC Version

(Requires 13.8V)
Cat D-3255

SAVE $200

Only **$2995**

2 Year Warranty

FT-990 H.F All-Mode Base Transceiver

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW,FM), with high duty cycle transmission allowed.
An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 90 memories and one-touch band selection. Microphone optional extra.

EXCESS STOCK CLEARANCE! - BELOW COST!

Great for 10M FM repeater operation!

UNBEATABLE VALUE **$1695**

2 Year Warranty

FT-650 6m, 10m, 12m 100W Transceiver

Now's the time to get ready for the summer DX season on the 6m and 10m bands, and the Yaesu FT-650 mobile transceiver allows you to do it in style. Its all-mode operation, 100W RF output (SSB, FM, CW), and continuous 24.5 to 56MHz receiver coverage allows you to hear signals outside the Amateur bands, so you can track the rising M.U.F and work stations as soon as the band opens. The use of 3 D.D.S's and a 2-stage low noise RF pre-amp results in a very quiet and sensitive receiver (SSB/CW, 0.125uV). To cater for the FM enthusiast, the FT-650 provides repeater offsets, as well as exceptional 0.16uV (12dB SINAD) sensitivity. Other features include selectable tuning steps, manual/auto IF notch filter, RF speech processor, IF shift control, 105 scannable memories and an effective noise blanker. Includes MH-1 hand microphone.
Cat D-3250

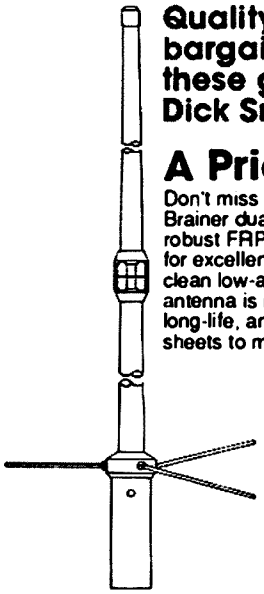
B 1531

Pick Up More With These BRAINER Bargains!

Quality Japanese antennas at a bargain price. Don't miss out on these great specials, exclusive to Dick Smith Electronics!

A Price Breakthrough!

Don't miss our best ever prices on these high performance Brainer dualband 2m/70cm base station antennas. They use robust FRP (fibreglass reinforced polyester) tubing construction for excellent all-weather operation, and a ground-plane for a clean low-angle radiation pattern which maximises gain. Each antenna is rated at 200W, uses stainless steel hardware for long-life, and comes with detailed locally-written instruction sheets to make construction easy.



Compact GST-1 2m/70cm Antenna

Frequency	144-148MHz, 430-450MHz
Gain	6dB on 2m, 8dB on 70cm
Length	2.5m
Type	2 x 5/8 wave (2m) 4 x 5/8 wave (70cm)

Cat D-4830 **$179** **SAVE $20**

BRAINER

Long Range GST-3 2m/70cm Antenna

Frequency	144-148MHz, 430-440MHz
Gain	7.9dB on 2m, 11.7dB on 70cm
Length	4.4m
Type	3 x 5/8 wave (2m) 7 x 5/8 wave (70cm)

Cat D-4835 **$269** **SAVE $10**

2m/70cm Magnetic Mobile

The black TM-723M is a slimline, compact dualband mobile antenna that's supplied with a low-profile magnetic mount and low-loss coax cable making it ideal for city drivers who can't use a long antenna. While only 0.7m high, it provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a conservative maximum power rating of 50W.
Cat D-4812

BRAINER **$69.95** **SAVE $20**

2m/70cm Mobile Antenna

The ST-7500 is a high-quality medium-sized dual-band antenna that uses a ground-independent design and a tiltable stainless steel whip structure to provide excellent mobile results. It's just 1m long, yet provides approximately 3dB gain on 2m and 5.5dB gain on 70cm with a maximum power rating of 150 watts. Requires an SO-239 antenna base or SO-239 magnetic base.
Cat D-4810

BRAINER **$69.95** **SAVE $10**

2m/70cm Hi-Gain Mobile

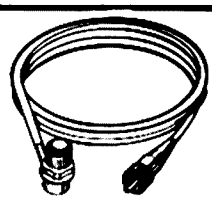
The ST-7800 is our best long-range, dualband mobile antenna, providing high gain (4.5dB on 2m and 7.2dB on 70cm), while only 1.5m in length. It incorporates an inbuilt tilt-over mechanism and has a maximum power rating of 150 watts. The ground-independent design also allows the use of gutter or boot/bonnet brackets for easier mounting. Requires an SO-239 antenna base.
Cat D-4815

BRAINER **$119.95** **SAVE $10**

SO-239 Base/Lead Set

A convenient way to mount a PL-259 type antenna. This quality Japanese SO-239 base is pre-wired with 4m of low loss coax cable and has a PL-259 already fitted for connection to your transceiver
Cat D-4052

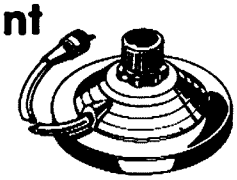
$24.95



SAVE $5

SO-239 Magnetic Antenna Mount

A powerful Japanese magnetic mount for use with PL-259 antennas. It's supplied with 4m of quality coax cable and fitted PL-259 plug. Suits small to medium VHF/UHF antennas such as the ST-7500.
Cat D-4520



$59.95

PHONE & MAIL ORDER SERVICE & YAESU BROCHURE HOTLINE
Outside Sydney (Free Call) 008 22 6610 Sydney & Enquiries - (02) 888 2105
Fax: (02) 805 1986 or write to Dick Smith Electronics, Mail Orders, Reply Paid 160 PO Box 321 NORTH RYDE NSW 2113
Yaesu stocks and some antennas not held at all stores, please contact your local store for stock availability, or order by phone 008 22 6610

DICK SMITH ELECTRONICS

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 9922 • Kotara 56 2092 • Liverpool 600 9699 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3956 • North Sydney (Greenwood Plaza) 964 9467 • Orange 618 400 • Parramatta 689 2199 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 ACT• Belconnen (06) 253 1786 • Fyshwick 280 4944 VIC • Ballarat 31 5433 • Bendigo 43 0389 • Box Hill 890 0688 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 388 Elizabeth St 326 6088 & 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 6338 • Springvale 547 0522 QLD • Booval 282 8200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 6255 • Maroochydore 791 800 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 SA• Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6088 • St Marys 277 8877 WA • Cannington 451 8666 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 TAS • Hobart 31 0800 • Launceston 344 655 NT • Darwin 81 1977

ALARA

*Robyn Gladwin VK3ENX**

Treasurers Together

When office-bearers in an organisation change, it is not often that they have the opportunity to hand over the reins in person. Val Rickaby VK4VR, the ALARA treasurer since September 1986, recently travelled to Dalby, Queensland to meet Margaret Schwerin VK4AOE the incoming treasurer. They are pictured on this occasion, the only time two ALARA treasurers have been photographed together. ALARA members thank Val and her OM, Brian VK4RX, most sincerely for their contribution to our Association.

New Zealand YL on Packet

In the latest edition of the WARO Bulletin, Ann ZL3TNT has written an article about her introduction to the world of Packet Radio. She was encouraged by her OM, David ZL3AI, and has now had packet connects with 14 countries besides New Zealand. She lists some of the advantages of the packet mode. She can send messages at a time that suits her. The person she is trying to contact does not have to be near a radio. She can correct all her typing errors before sending the message and she has LOTS of new friends.

However, it was her last paragraph that led me to feature her work in this column and I quote: *"There does not seem to be a lot of YLs active on Packet, but those of us that are, tend to share contact addresses. So, if you have a computer, and want to try something a bit different in radio, then why not get Packet up and running and join us. We would love to hear from you. My packet address is ZL3TNT@ZL3AC.#80.CHC.NZL.OC."*

Silent Key

While still in New Zealand, ALARA extends our deepest sympathy to the family of Dr Brenda Shore ZL4OQ, a sponsored DX member, who passed away on 18th June, 1993.

ALARAMEET Update

Every three years, ALARA holds an ALARAMEET or gathering of members, OMs and harmonics. It is an opportunity for those attending to put a face to a well-known voice on the radio, or for old friends to catch up on the latest news in person. This year, the ALARAMEET will be held in the Central Victorian town of Castlemaine on 1st, 2nd and 3rd October. The Co-ordinator is Margaret Loft VK3DML, who has worked very hard for almost 2 years to organise the venue, activities and accommodation necessary to make the event a success.

Margaret now has 88 names on the list of those wishing to attend and interest has been shown from as far afield as Germany, USA, Japan and New Zealand as well as Australia. Kathy VK3XBA and Chris VK3LCR have kindly consented to act as drivers for two groups of YLs who are able to attend only on the Saturday and do not wish to stay overnight. As it is now less than 8 weeks to the ALARAMEET, Margaret would appreciate knowing any last minute changes participants need to make to either accommodation or catering arrangements so that she can give final numbers to the organisations in the region who are providing the various services and activities.

*Box 438 Chelsea 3196 VK3ENX@VK3YZW

Margaret Schwerin VK4AOE and Val Rickaby VK4VR recently travelled to Dalby, Queensland to meet.

ar

Club Corner

Radio Amateurs Old Timers Club

A reminder is given that the August QSO parties will be held on Monday 2nd on 3.5 MHz and Monday 9th on 7. MHz. Details are in OTN March 1993. Members and other listeners to the Club's broadcast on the first Monday of each month are reminded that we now repeat the broadcast in the evening at 8.30 pm local time on 3.635 MHz subject to QRM. It has been heard in VK3, 4, 5 and 7. Although it has not been responded to as actively as we had expected we will continue with it for a while yet. Our July 5 broadcast included a list of the VK stations worked with 5 watts CW from Heard Island in 1947/48/49 by Alan Campbell Drury VK3CD who operated there as VK3ACD.

The next issue of the club magazine "OTN" will be published in September. Results of the two August QSO parties will be published in a later issue of "Amateur Radio".

Allan Doble VK3AMD

Moorabbin and District Radio Club

A dedicated group of younger members put in many hours of hard work at the club station (VK3APC) participating in the Novice Contest. Operators report that the conditions seemed more difficult than in previous years and that most contacts were made on 80 metres. Friends of the club are reminded that all correspondence should be directed to our new Post Office box which is PO Box 58, Highett VIC, 3190.

Allan Doble VK3AMD

ar

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX163	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1988	BX259	$104.00
Cubical Quad Antennas — Haviland — 1993	BX041	$37.50
Easy Up Antennas	MFJ38	$39.25
HF Antennas for All Locations — Moxon	BX188	$45.00
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX182	$16.00
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX386	$40.00
Practical Antenna Handbook — Tab	BX026	$49.00
Practical Wire Antennas — RSGB	BX296	$28.00
Reflections — Software 5 inch disk	BX358	$20.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$6.60
Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$6.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$6.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BAIC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$49.95
Radio Call Book North America 1993	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley QTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX389	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX266	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX387	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX196	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1976	BX263	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BX188	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$18.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1986	BX282	$79.90
Radio Auroras — RSGB	BX381	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$18.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$36.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing — ARRL	BX388	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX396	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$38.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$18.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX168	$36.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1988 — ARRL	BX167	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX168	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Operator's Manual — Rogers — 1993	BX043	$37.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX316	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX448	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX385	$40.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX288	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$48.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Car Bumper Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net
Control station VK5AGR
Bulletin normally commences at 1000 Z, or 0900 Z on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz (Usually during winter).

Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia, addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Software Review

Last month I mentioned an excellent little utility called ITSORT. It is part of a suite of software that is being circulated around AMSAT circles via AMSAT-NA. The suite also contains utilities to generate up-coming passes of various satellites in chronological order and a number of files of interest to users of the Kansas City Tracker and the QUICKTRACK tracking program.

ITSORT will be of great value to users of INSTANTRACK which is probably the most popular of all tracking programs INSTANTRACK has one major short-coming. Users cannot easily re-arrange or edit the satellite data base. It is a very clumsy operation to move satellites around or keep all the amateur satellites together etc. It usually involves quite a bit of deleting and re-entering of data. I had gone to the trouble of doing this some time ago. What a difference this ITSORT utility makes.

It allows you to use your favourite screen editor to do what you will with the satellite data base. It comes with an easy to read document. When you have installed it in your IT directory, you type ITSORT and it goes to work creating a file called SAT-NAMES.LST.

This an ASCII file which can be edited to re-arrange the satellite names into the order you prefer. You may like to have the first column reserved for amateur satellites, the next for weather satellites, the next for scientific satellites etc, or you may have a few favourite satellites you would like to be in the first column or on the first page. Having done the editing you save the new file as (say) C:/IT/SATNAMES.LST, overwriting the original. When you run ITSORT again it will use the new file to re-arrange the satellite data base in IT. You can use a "*" or a "-" to reserve a few places here and there if you like but it really doesn't matter as it's so easy to edit the file at any time.

Now when I run INSTANTRACK I'm presented with a satellite file which fills the first page with the ones I'm most interested in and the odds and sods are relegated to the following pages.

Whilst on the subject of software, I must mention the almost breathtaking array of software offered by AMSAT-VK. Graham's newsletter contains regular reviews of ALL new amateur satellite related software. Hardly a month goes by without a new batch of software being reviewed. I would urge all who are interested in amateur radio satellites, or who are developing an interest in this field of amateur radio, to join AMSAT-VK as I believe that the software service alone just has to be worth the membership donation.

ARSENE Report

The news keeps rolling in but it's not all good. It seems that all attempts so far to recover the 2 metre down-link system have been unsuccessful. Meanwhile, many reports are coming in regarding the "S" mode transponder. It seems that to have any hope of working it you will need a pretty good setup. The strength of the down-link signal has been compared to that of sun-noise. EME folk, those doyens of the amateur radio service, tweak up their systems on sun noise.

I believe it's necessary to have your system capable of receiving 10 dB or so of sun noise before you can get all excited about EME. A lot of people are very disappointed about the potential of ARSENE but the problems could be a blessing in disguise. We seem to be generally heading in a "bigger is better" direction in amateur radio satellites with the ultimate goal being to sit back in an arm chair and work the birds on a hand-held transceiver. I think I'll go back to astronomy if that happens!

It may well come to pass that a satellite like ARSENE will put some of the technical "fire" back into working the birds. If more amateurs take up the challenge of working ARSENE and succeed, we may well see them go on to try their luck at EME with their newfound state-of-the-art stations. Maybe the EME folk will find themselves well placed to exploit this new bird with its wonderful high altitude, equatorial orbit. There's not all that much EME activity on 13 cm due to the difficulty of generating high power RF at 2.4 GHz but "S" mode involves receive only and a 13 cm feed would be a simple addition to any EME dish.

ZRO Test Record Broken

I have mentioned the ZRO tests in this column before. They constitute a contest of the best possible kind. A contest where "hog-calling" will get you no points at all and the only thing you are trying to beat is your own previous best effort. A contest where the stations with the very best RECEIVING apparatus get the results.

In brief, a signal is transmitted through a satellite transponder and is adjusted to be the same strength as the down-link

beacon. It is then attenuated 3 dB at a time during which time Morse code groups are transmitted. The idea being to see how good your receiving setup is by copying as far down into the noise as you can. Now the signal is not all that strong to begin with and 30 dB is a long way down but it has been announced that the -30 dB level, the magic level "A", has been successfully copied by Darrel AA7FV using digital signal processing techniques.

It's interesting to note that his RF equipment wasn't anything out of the ordinary but the DSP involved used up several hours of computing time on a 386 PC! It is generally agreed that an average satellite station will be able to copy about ZRO level 5, receiving by ear. The signals usually disappear below the transponder noise floor at about ZRO level 7 or 8 and from there on only digital processing of some kind will retrieve the signal content.

Many stations are in this league, a few with endorsements down to ZRO level 9. This, however, is the first time anyone has gained endorsement at -30 dB ie level 10 or "ZRO-A". And someone said it's all been done! Where to next?, I wonder.

MIR Crew Change

Maggie VK3CFI reports that the new MIR crew, Vasily Tsiblyev R3MIR and Aleksandr Serebrov R4MIR have been "on-air" and we can expect the same high level of amateur radio activity from them as from the previous crews. They will be changing back to the original frequency of 145.550 MHz and will no longer be using 145.850 MHz due to interference caused to AMSAT operations on that frequency.

Maggie says that Serebrov is the 5th Aleksandr that we have all had the opportunity of speaking to on MIR as well as 2 Sergejs and 2 Anatolys. (And of course, who could forget Musa?). At the time of writing there are 5 people on MIR and Alex R2MIR reported the situation as "joyful".

*359 Williamstown Rd Yarraville VIC 3013
Packet: VK3JT@VK3BBS
ar

AWARDS

John Kelleher VK3DP Federal Awards Manager

Switzerland (HB) — The Helvetia Award

This award is issued by the USKA (Union of Swiss Short Wave Amateurs) for working and confirming contacts with **ALL 26 CANTONS** since 1st January 1979. The award is issued in four categories — mixed phone and CW, CW only, RTTY, and SSTV. Cross-mode and cross-band contacts are not valid.

The cantons, preceded by their abbreviations, are as follows:

AG — Aargau
AI — Appenzell (Inner Rhoden)
AR — Appenzell (Outer Rhoden)
BE — Berne
BL — Basle (country)
BS — Basle (city)
FR — Fribourg
GE — Geneva
GL — Glaris
GR — Grisone
JU — Jura
LU — Lucerne
NE — Neuchatel
NW — Nidwalden
OW — Obwalden
SG — St. Gall
SH — Schaffhausen
SO — Solothurn
SZ — Schwyz
TG — Thurgau
TI — Ticino
UR — Uri
VD — Vaud
VS — Valais
ZG — Zug
ZH — Zurich

QSLs should indicate the canton, and they should be sent, along with a list of the QSLs (complete with QSO data) to **Kurt Binschedler HB9MX, Strahleggweg 28, 8400 — Winterthur, Switzerland.**

The award is free but sufficient IRCs should be included to cover the cost of return postage of QSLs.

WIA DXCC Listings

The listings below are current as at 1st July 1993.

WIA DXCC STANDINGS
PHONE
Honour Roll

CALLSIGN	COUNTRIES
VK6HD	328/342
VK6LK	327/349
VK3QI	326/335
VK3DYL	326/329
VK5MS	323/373
VK4KS	323/365
VK4LC	323/365
VK5WO	323/354
VK3AKK	323/331
VK6RU	322/373
VK5XN	322/338
VK4RF	322/337
VK5EE	321/322
VK2FGI	319/320
VK3OT	318/327
VK4OH	318/320
VK6NE	316/328
VK3CSR	316/320
VK3YJ	316/318
VK1ZL	316/317
VK3AMK	314/329
VK6AJW	314/317

General Listing

VK4VC	308/324
VK5WV	305/322
VK3RF	305/311
VK3AWY	305/310
VK3WJ	305/308
VK7BC	303/309
VK2WU	294/296
VK4UA	293/308
VK4PX	292/312
VK6PY	292/295
VK2AKP	291/294
VK4UC	290/306
VK2DTH	288/289
VK2APK	287/313
VK6RO	287/289
VK6VS	287/288
VK4BG	286/299
VK7AE	285/291
VK3CYL	284/290
VK3DU	284/290
VK4DP	283/292
VK5OU	283/286
VK3VU	272/275
VK3JI	266/279
ZS6IR	261/262
VK3GI	260/262
VK3VQ	257/272
VK2SG	254/274
VK2AVZ	253/257
VK4QO	253/255
VK2ETM	240/
VK2PU	239/240
VK6YF	239/240
PS7AB	236/237
VK3DP	232/233
VK2BCH	224/226
VK2CKW	224/225
VK4OX	220/222
VK5BO	220/222
VK5IE	220/221
VK4OD	216/219
VK1PS	211/212
VK2VBL	208/209
VK4XJ	205/216
VK3DD	202/204
ON6DP	202/
VK4KRP	200/201
VK2VFT	199/201
VK6BQN	187/190
KA1TFU	177/178
VK2BQS	162/163
VK3DVT	160/161
7J1AAL	150/
VK3DNC	142/
VK6LC	140/
VK4VJ	136/137
VK4DMP	128/
SM6PRX	125/126
VK3CIM	123/125
VK7YP	123/124
VK7WD	116/
VK3BRZ	115/116
VK2SPS	114/115
VK4ICU	112/114

VK4NJQ	111/115
VK4ARB	111/
VK4LV	108/110
VK5GZ	108/109
VK5AGM	106/107
VK4EJ	105/106
N4JED	105/
VK4BAY	105/
VK3EHP	104/105
VK4VIS	104/105
VK4BJE	103/104
VK3YH	103/
VK5ZH	101/104
VK2CMV	101/102
VK4KGE	100/101

WIA DXCC STANDINGS
CW
Honour Roll

CALLSIGN	COUNTRIES
VK6HD	323/341
VK3QI	323/330

General Listing

VK2QL	313/359
VK3XB	313/343
VK3YL	304/340
VK4RF	304/328
VK3KS	299/322
VK6RU	275/317
VK2APK	275/304
VK5WO	267/268
VK3AKK	263/265
VK3JI	242/265
VK3DP	215/217
VK7BC	212/219
VK4DA	208/209
VK2CWS	204/205
VK4DP	195/205
VK4LV	184/190
VK6PY	179/181
VK4UC	170/178
VK3CIM	161/
VK5BO	160/184
VK4XJ	151/163
VK5GZ	151/152
VK3DNC	147/148
VK4UA	143/177
EA6AAK	138/
VK7DQ	138/
VK2SG	137/148
VK6ASO	132/133
VK4KS	127/139
VK2TB	124/125
VK3AGW	120/
VK2AKP	116/117
VK5QJ	108/109
VK4FB	105/106
VK4PX	104/112
VK5AKH	100/101
VK6BHW	100/101
DK9EA	100/

WIA DXCC STANDINGS
OPEN
Honour Roll

CALLSIGN	COUNTRIES
VK6HD	328/349
VK3QI	326/336
VK4KS	323/365
VK5WO	323/354
VK3AKK	323/331
VK6RU	322/373
VK4RF	322/354
VK5QW	322/324
VK3YL	321/363
VK3OT	321/330
VK3JA	318/363
VK3AMK	314/329

General Listing

VK7BC	313/318
WA3HUP	308/330
VK3XB	303/340
VK4PX	299/323
VK4UA	296/310
VK2APK	294/328
VK4BG	293/309
VK6PY	293/298
VK4UC	292/310
VK2AKP	291/294
VK2SG	290/314
VK4DP	288/299
VK3DP	288/290
VK6RO	288/290
VK3JI	287/311
VK3CYL	284/290
VK4OD	276/279
VK3VQ	272/287
VK5BO	266/301
VK4ICU	253/
VK4XJ	234/249
VK4DA	209/210
VK3CIM	207/209
VK2VFT	203/205
VK3DNC	181/182
PR7CPK	175/
VK2BQS	172/173
VK5GZ	164/165
VK6NV	155/156
VK6LC	142/143
VK6ASO	137/138
VK4NJQ	134/139
VK2CXC	129/130
VK4ICU	125/127
VK4EZ	123/131
VK2AMV	120/126
VK5BWW	111/
VK4CHB	109/109
VE7RD	107/
VK3COR	103/104
VK7TS	102/
SM7WF	101/
VK7DS	100/102
VK2KE	100/
VK5ZN	100/

WIA DXCC STANDINGS
RTTY
Honour Roll

CALLSIGN	COUNTRIES
VK3EBP	169/170
VK2SG	159/160
VK2BQS	109/110
VK5RY	101/102

ar

Contests

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Aug-Oct 93

Aug 1	Jack Files Memorial (CW)	(Jun 93)
Aug 1	VK6 Annual 80 m Contest (CW)	(Jul 93)
Aug 7/8	YO DX Contest (Mixed)	(Jul 93)
Aug 14/15	Remembrance Day Contest	(Jul 93)
Aug 14/15	Worked All Europe (CW)	(Jul 93)
Aug 14/15	SARTG RTTY Contest	
Aug 14/15	SEANET DX Contest (SSB)	
Sep 4/5	All Asia DX Contest (SSB)	(Jul 93)
Sep 5	Bulgarian DX Contest	
Sep 11/12	Worked All Europe (SSB)	(Jul 93)
Sep 18/19	SAC DX (CW)	
Sep 25/26	SAC DX (Phone)	
Sep 25/26	CQ WW RTTY DX Contest	
Oct 2/3	VK/ZL/Oceania Contest (SSB)	
Oct 3	RSGB 21/28 MHz Contest (SSB)	
Oct 9/10	VK/ZL/Oceania Contest (CW)	
Oct 9/10	Iberoamericano Contest (SSB)	
Oct 13/14	YLRL Anniversary Party (CW)	
Oct 16/17	Worked All Germany Contest	(Mixed)
Oct 17	RSGB 21/28 MHz Contest (CW)	
Oct 23/24	CQ WW DX Contest (Phone)	
Oct 27/28	YLRL Anniversary Party (SSB)	

Digital buffs are well catered for at the moment with this month's SARTG RTTY Contest, followed by next month's CQ WW RTTY Contest, which is also open to AMTOR, packet, etc. More observant readers will also have noted the addition of a *Digital* section to our own long-running and very popular Remembrance Day Contest.

The digital section has been added to the "RD" as a trial, to test the amount of interest it generates. As such it provides an opportunity for the growing number of amateurs who have multimode controllers to test their equipment and digital operating skills, without the hassle of entering a big DX contest. If you own such a controller, why not try it out in the RD? Your participation will help your division, and you might even have a lot of fun as well!

In last month's column I expressed puzzlement over an obscure rule for the WAE DX Contest, viz "the minimum time of operation on a band is 15 minutes, although a quick band change to work a new multiplier is allowed". I am happy to say that this means a band change to work another station is allowed before the 15 minute period expires, *if* the station worked on the new band is a new multiplier. Apart from this, the 15 minute restriction still applies. (For this and many other contests which have a similar rule, the point is obviously to prevent amateurs with multi-TX stations having an unfair advantage over the rest of us with only one TX. In these days of quick-tune rigs, I think such rules are becoming increasingly anachronistic. However, I don't make the rules!)

Thanks to VK2PS for contest information. To everyone, please keep the letters coming, especially any spare copies of rules or results. Until next month, good contesting!

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in April AR.

SARTG RTTY Contest

Sat Aug 14, 0000-0800 z & 1600-2400 z; Sun Aug 15, 0800-1600 z.

This contest is sponsored by the Scandinavian Amateur Radio Teleprinter Group for 80-10 m. Classes are single operator, single and multiband; multi-operator single TX; SWL. Exchange RST and QSO number. Claim 5 points for QSOs with own country, 10 points for other countries on the same WAC continent, and 15 points for other WAC continents. Multiplier is total DXCC countries plus each call area in USA, VE/VO, and VK. Final score equals total QSO points (all points) times total multiplier (all bands). Use a separate log and summary sheet for each band. Send logs to be received by 8 Oct to: SARTG Contest Manager, Bo Ohlsson SM4CMG, Skulsta 1258, S-71041 Fellingsbro, Sweden.

SEANET DX Contest (SSB)

August 14/15, 0000 z Sat — 2400 z Sun.

This annual event is sponsored by the Radio Society of Thailand. The objective is to promote contacts between amateurs worldwide and stations in the "SEANET" area on 160-10 m (this area includes Southeast Asia, neighbouring oceanic countries, VK, and ZL). Categories are single operator, single and all bands; and multi-operator single transmitter all bands. Call "CQ SEA" or "CQ SEATEST", and exchange RS(T) plus serial number starting at 001 on each band. Multipliers are SEANET country prefixes: A4, A5, A6, A7, A9, AP, BV, BY/BZ, DU/DV/DX, EP, HL, HS, JA, JD1, JY, KH2, P2, S7, VK1-9, VQ9, VS6, VU, V8, XU, XV, XW, XX, YB/YC/YE, ZK, ZL/ZM1-4, ZL6/ZM6, ZM7, ZM8, ZM9, 3B6/3B7, 3B8, 3B9, 4S, 4X/4Z, 8Q, 9K, 9M2, 9M6/9M8, 9N1, 9V.

Stations in the SEANET area should score 10 points for each QSO on 160 m, 5 points on 80/40 m, and 2 points on 20/15/10 m. Exception: claim double points for QSOs with DU/DV/DX, HS, YB/YC/YE, 9M2/6/8, 9V, V8. Contacts with stations in one's own country are not permitted for contest credit. The multiplier equals the number of SEANET countries (as defined above) times 2, plus the number of non-SEANET countries (ie DXCC) times 3. The final score equals the total points times the total multiplier.

No update for this year's contest has been received, so it is suggested you send your log to: SEANET 93, Eshee Razak 9M2FK, Box 13, 10700 Penang, Malaysia. Include 3 IRCs for results. Logs must be received by 31 Oct.

Bulgarian DX CW Contest

Sep 5, 0000 z — 2400 z Sun.

This contest is organised by the Bulgarian Federation of Radio Amateurs, and runs on the first Sunday of September each year on 80-10 m. Classes are: single operator, single and all band; multi-operator single transmitter all band; SWL. Exchange RST plus ITU zone (P2 = 51, VK4/8 = 55, VK6 = 58, VK1/2/3/5/7 = 59). Multiplier equals the total ITU zones worked on each band. Score 6 points for each QSO with an LZ, 3 points for each QSO outside your WAC continent with a non-LZ, and 1 point for each QSO within your WAC continent. SWLs score 3 points if both exchange numbers are copied, and 1 point if only one exchange number is copied. The final score equals the total QSO points (all bands) times the total multiplier (all bands). Send logs postmarked by Oct 5 to: Central Radio Club, Box 830, 1000 Sofia, Bulgaria.

35th Scandinavian Activity Contest

September 18/19 (CW), September 25/26 (Phone); 1500 z Sat — 1800 z Sun.

The CW section of this contest runs on the 3rd full weekend of September each year, and phone 1 week later. The aim is to promote contacts between Scandinavian and non-Scandinavian amateurs on 80-10 m (no WARC bands). Scandinavian prefixes are: LA/LB/LG/LJ (Norway); JW; JX; OF/OG/OH/OI (Finland); OH0 (Aland Isl); OH0M/OJ0 (Market Reef); OX; OY; OZ; SI/SJ/SK/SL/SM/7S/8S (Sweden); TF.

Categories (all band only) are: single operator; single operator QRP (max 10 W I/P); multi-operator single transmitter; SWL. The use of DX spotting assistance from other than the station operator/s is not allowed.

Exchange RS(T) plus serial starting at 001. QSOs after 999 are numbered 1000, 1001 etc. For each QSO, non-European stations should score 1 point on 20, 15 and 10 m, and 3 points on 40 and 80m. The multiplier is the number of Scandinavian call areas (0-9) worked on each band. Portable stations without a district number count as area 0, eg G3XYZ/LA counts as LA0. OH0 and OH0M/OJ0 are separate call areas. SI3-SK3-SL3-SM3-7S3-8S3 count as 1 multiplier, not 6. The final score is total QSO points (all bands) times total multiplier (all bands).

Use standard format for logs and summary sheets. Show duplicate QSOs with 0 points. Dupe sheets are required for 200+QSOs. Forward separate logs for CW and phone sections. Logs on DOS disk in lieu of paper are welcome. Summary sheet must be on paper. Disk logs must be in ASCII, 1 QSO per row. CW and phone logs can share the same disk. Disks must be labelled with call, name and date of contest, CW/Phone, and category. Include an SASE if you want your disk returned. Send logs postmarked by 31 Oct to: Liv Johansen LA4YW, NRRL HF Contest Manager, Box 142, N-7078 Saupstad, Norway. Comprehensive awards to top scoring stations.

CQ WW RTTY DX Contest

Sep 25/26, 0000 z Sat — 2400 z Sun.

This contest is jointly sponsored by CQ Magazine and the RTTY Journal. The object is to contact as many stations worldwide as possible, using Baudot, ASCII, AMTOR (FEC & ARQ), or Packet, on 80-10 m (No unattended operation or operation through gateways or digipeaters).

Categories are: Single operator unassisted, single and muitiband; Single operator assisted, all band; Multi-operator single TX, all band ("10 minute" rule applies to this category EXCEPT that one — and only one — other band may be used during the 10 minute period, if — and only if — the station worked is a new multiplier); Multi-operator multi TX, all band.

For single operator stations can operate 30 hours max. Rest periods must be at least 3 hours each, and the on and off periods must be clearly marked in the log. If single operator stations operate more than 30 hours, only the first 30 hours will count towards the official score. Multi-operator stations may operate for the full 48 hours.

Stations may be contacted only once per band, regardless of the mode used. Send RST plus CQ zone; W/VE will send RST, state or area, and CQ zone. Count 1 point for each QSO with stations in your own country, 2 points for each QSO outside your country but inside the same WAC continent, and 3 points for each QSO with stations outside your continent. On each band, the multiplier equals the sum of US states (max 48) and Canadian areas (max 13) *PLUS* DXCC countries (including W and VE) *PLUS* CQ zones (max 40). Note: KL7 and KH6 are claimable as country multipliers only, not state multipliers. Canadian areas are VO1, VO2, VE1 (NB), VE1 (NS), VE1 (PEI), VE2, VE3, VE4, VE5, VE6, VE7, VE8, VY. The final score equals total QSO points times total multiplier from all bands.

Submit a single summary sheet including scoring calculations for all bands, plus for each band a separate log, duplicate check list, and multiplier check sheet. Send logs postmarked by 1st December to: Roy Gould KT1N, CQ WW RTTY Contest Director, Box DX, Stow, MA 01775, USA. (To forestall calls from worried entrants, Box "DX" is not a misprint!) A comprehensive range of plaques and certificates is offered.

Results of 1992 CQ WPX Contest

In order: Call, Band, Final Score, QSOs, Prefixes. *= Low power, #= QRPp. Certificate winners are in bold.

Single Operator SSB:

VK3TZ	A	2,234,804	1356	572
VK5GN	"	1,382,745	1001	455
VK3HZ	"	223,776	345	224
VK2ARJ	28	1,444,285	1137	437
VK5PMC	"	136,170	267	170
VK3SM	14	103,964	200	188
VK3DZM	3.5	33,024	86	64
*VK2AYK	A	481,824	493	336
*VK7ST	"	102,375	210	175
P20A	28	5,184,625	2585	703

Multi-operator Single Transmitter SSB:

VK1DX	6,097,014	2853	747
P29CG	5,099,601	2556	687
VK6ANC	3,510,912	1848	656
VK4WIE	3,088,176	1720	624

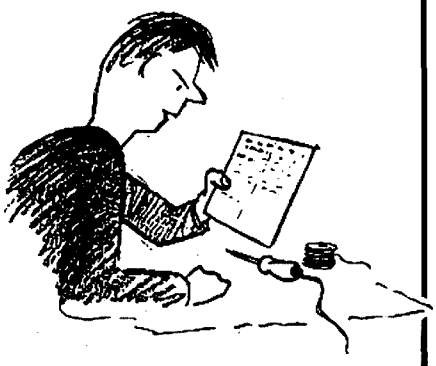
Single Operator CW:

AX8AV	A	1,325,524	1041	386
VK4TT	14	3,990	38	35
*VK6HG	A	81,770	166	130
*VK4XA	28	30,480	127	80
#VK5AGX	A	42,180	117	95

For Oceania, VK3DZM topped the 80 m SSB section, AX8AV topped the all band CW section, and VK4TT topped the 20 m CW section. On 28 MHz CW, VK4XA had 4th best score worldwide.

73

Peter VK3APN



"Plug it in to the 240 volt mains socket and switch on. The sharp end gets hot. Hold it by the cold end. Look at the solder. It is like soft grey wire, and when you touch it with the hot end it melts. Now comes the tricky part . . ."
— VK3AUC.

1993 JOHN MOYLE FIELD DAY CONTEST RESULTS

Call	Name/Club	Hrs	Cat	Ops	Band	Mode	Pts
VK6BBY	South West Amateur Radio Group	6	HOME	MULTI	HF	PHONE	108
VK4BHL	Jonathon Bourner	6	HOME	SNGLE	OPEN	PHONE	67
VK4BTS	Mike Howard	6	HOME	SNGLE	HF	OPEN	103
VK6WOG	Peter Ferguson	6	HOME	SNGLE	HF	PHONE	163
VK1KLB	Lawrie Brown	6	HOME	SNGLE	HF	PHONE	42
VK4WIN	Brisbane North Radio Club	6	PORT	MULTI	OPEN	OPEN	276*
VK3ER	EMDRC	6	PORT	MULTI	OPEN	OPEN	136
VK5BAR	Adelaide Hills A R S	6	PORT	MULTI	OPEN	PHONE	410*
VK2HZ	Blue Mountains A R C	6	PORT	MULTI	HF	OPEN	284*
VK4WIZ	The Radio Amateurs Group	6	PORT	MULTI	HF	PHONE	484*
VK4WIW	Cunningham Radio Club	6	PORT	MULTI	HF	PHONE	310
VK6YG	Geraldton Amateur Radio Group	6	PORT	MULTI	HF	PHONE	154
VK4OE/2	Doug Friend	6	PORT	SNGLE	OPEN	OPEN	1114*
VK4BLE	Laurie Pritchard	6	PORT	SNGLE	OPEN	OPEN	392
VK5AGZ	Derek Reuther	6	PORT	SNGLE	OPEN	PHONE	376*
VK3ZA	John McL Bennett	6	PORT	SNGLE	HF	PHONE	78*
VK2ANK	Neil Kefford	6	PORT	SNGLE	VHF/UHF	PHONE	478*
VK2XCI	Norm McMillan	6	PORT	SNGLE	VHF/UHF	PHONE	220
VK5BMT	Maria McLeod	24	HOME	SNGLE	OPEN	PHONE	91
VK3XB	Ivor Stafford	24	HOME	SNGLE	HF	CW	27
VK3KS	Mavis Stafford	24	HOME	SNGLE	HF	CW	12
VK6XG	Andy Russell	24	HOME	SNGLE	HF	PHONE	392
VK4BJJ	Julie Brumley	24	HOME	SNGLE	HF	PHONE	147
VK2UC	Alf Webb	24	HOME	SNGLE	HF	PHONE	41
VK1DO	Christopher Davis	24	HOME	SNGLE	VHF/UHF	PHONE	50
VK6ANC	Northern Corridor Radio Group	24	PORT	MULTI	OPEN	OPEN	5268*
VK4WIS	Sunshine Amateur Radio Club	24	PORT	MULTI	OPEN	OPEN	2612
VK5ARC	South Coast Amateur Radio Club	24	PORT	MULTI	OPEN	OPEN	1798
VK4CHB	Hervey Bay Amateur Radio Club	24	PORT	MULTI	OPEN	OPEN	1242
VK1CEE	J Hendrickson & P Westerhof	24	PORT	MULTI	OPEN	OPEN	178
VK4IZ	Redcliffe Radio Club	24	PORT	MULTI	OPEN	PHONE	4124*
VK3APC	Moorabbin & District Radio Club	24	PORT	MULTI	OPEN	PHONE	1428
VK2FBK	Jeff Brill	24	PORT	MULTI	OPEN	PHONE	1358
VK3GH	Healesville Amateur Radio Group	24	PORT	MULTI	OPEN	PHONE	494
VK5GRC	North East Radio Club	24	PORT	MULTI	OPEN	PHONE	444
VK4DGS	Sergio Gianoli	24	PORT	MULTI	OPEN	PHONE	368
VK4AKH	Granite Belt Radio Group	24	PORT	MULTI	HF	OPEN	828*
VK2WO	Rob Freedman	24	PORT	MULTI	HF	OPEN	534
VK4WIT	Townsville Amateur Radio Club	24	PORT	MULTI	HF	OPEN	286
VK6PM	DP Murphy	24	PORT	MULTI	HF	OPEN	244
VK8DA	Darwin Amateur Radio Club	24	PORT	MULTI	HF	PHONE	388*
VK4WIE	City of Brisbane Radio Society	24	PORT	MULTI	VHF/UHF	PHONE	5526*
VK6KZ	Walter J Howse	24	PORT	SNGLE	OPEN	OPEN	3024*
VK5NW	Grant McEwing	24	PORT	SNGLE	OPEN	OPEN	1040
VK4MWK	Bernard Terry	24	PORT	SNGLE	OPEN	PHONE	1088*
VK4OR	Bruce Bussenschutt	24	PORT	SNGLE	HF	OPEN	600*
VK5JAA	David Giles	24	PORT	SNGLE	HF	PHONE	240*
VK4EV	Ron Everingham	24	PORT	SNGLE	HF	PHONE	106
VK5BW	Alan Raftery	24	PORT	SNGLE	VHF/UHF	PHONE	1472*

Portable entries marked with an asterisk will receive a certificate. As the aim is to encourage portable operation, home stations do not qualify for awards. The President's trophy will not be awarded due to the lack of single operator CW activity.

Unfortunately, I was unable to take part in the contest as I was holidaying in ZL and only took a handheld (only 3 contacts in 2 weeks!!!) No regrets though. We had a ball in the "land of the long white cloud", and the SW region of the south island is something to behold.

Numbers were similar to last year, but on Sunday things slowed down when the 6 hour operators disappeared. What about dropping the 6 hour section? Please get back to me on this. It may be appropriate since there are some sprints around to cater for those who cannot find the full 24 hours.

Comments from logs: It was the first time I entered and I thoroughly enjoyed it. Whilst being in a small tent on a hill with plenty of wind about, calling "CQ CONTEST" for 24 hours isn't everybody's idea of fun, the thrill of working USA and NZ for the first time and also having 10 m open for a change mad

(sic) it all worthwhile (David VK5JAA). ("Mad" aren't we all! 1PJ).

To win is (etc) but just competing and sharing the friendly rivalry is as much a part of the game as being in the winners circle (Jim VK4BX/VK4CHB) (The more the merrier Jim, and you had a club BBQ to boot! 1PJ).

(Bernard VK4MWK took lots of gear but the last three items took my eye: "Heaps of coax, heaps of rope, and heaps of sweat". Thanks Bernard, hope you didn't get into "heaps" of trouble from the minister for war and finance at home. 1PJ).

My petrol motor split the pin holding the flywheel in place, and it died shortly after. Had to work all Sunday off the battery (Bruce VK4OR) (Good lesson. How many of you had battery backup in case the gene failed? Bruce also asked if it is possible when contacting DX stations that the serial number from the DX station could be a name instead of a serial number. That sounds like a good idea as it still entails an exchange of information. 1PJ).

I took part to be able to exchange reports and numbers with stations who went to the trouble of setting up their gear in portable locations, and enjoyed the event (Maria VK5BMT) (Thanks Maria, 1PJ).

It's definitely "field day" country out here. The population of Mt Hope is 9! The closest ham is Noel, VK2ENA 112 km ENE. Just walking to the pub is an excursion! The local club, Albert Amateur Radio Group, with a membership of about 10, is spread over 2,000 square km. (Norm VK2XCI) (Boy are you in the bush! Can anyone find Mt Hope? You wouldn't want to get too thirsty! 1PJ).

I had a very difficult time erecting antennas in 40 knot winds with sleet straight off the Southern Ocean. After 4 hours and the partial destruction of each beam antenna I was operational (Alan VK5BW) (Was that where you got the "folded" dipoles from? 1PJ).

Well, there were more but I had better close. Congratulations to all, and I hope to see you on air. It looks as if the rules will need little change for next year.

Philip VK1PJ
John Moyle Contest Manager
ar

Remember to leave a three second break between overs when using a repeater.

Divisional Notes

Forward Bias — News from the ACT Division

Chris Davis VK1DO

Our news broadcasting timetable appears to have been well received with promising indications on both the Monday night call-backs as well as the Wednesday evening rebroadcast. These rebroadcasts are being handled by a rotating roster of volunteers who take on the job for three or four weeks. There is no great skill involved in undertaking this responsibility with all the equipment being handed over requiring only an antenna to be connected. The time-out pauses are automatically handled by the tape deck and decoding transmitter controller. So if you think you could take on the job for a month please put up your hand.

Our July meeting included aspects of our current broadcast set up as well as some tips on engineering your own station for operation from just one microphone. An operational demonstration of the system being used for repeat broadcasts was shown to members proving just how straightforward the whole task now is.

The August general meeting will be addressed by our District Radio Inspector Gilbert Hughes on the subject " The new Spectrum Management Authority and what it means to you". I hope that students, novices, old hands and anyone interested will take advantage of an excellent opportunity to clarify much of the confusion and misinformation that currently abounds.

The September meeting will conclude a presentation by Ian Cowan VK1BG on radio communications and civil aviation. I am certain that this topic will be of enormous interest to all of us who have had only rare glimpses of what facilities the CAA maintains and uses.

The ACT Packet Group is again hosting the technical symposium to be held this year on Saturday October 30th at the Southern Cross Primary School which is in the suburb of Scullin. Suggestions for topics to be included or offers of presentations or demonstrations can be made to Gavin Berger VK1EB or Neil Pickford VK1KNP Contact telephone numbers are Gavin on 06 258 539 and Neil on 06 258 7803 and 06 274 8422. The usual BBQ lunch and action packed education day are promised.

Please remember to participate in the Remembrance Day Contest, known affectionately as the friendly contest. Remember to submit a log showing at least ten contacts. Bring your log and summary sheet to the August meeting and we will submit them for you. I look forward to working you all during the friendly contest. So dust off that 52.525 radio, get some antennas ready for that challenging non-repeater operation and I look forward to giving my "number" to you.

VK2 Notes

Tim Mills VK2ZTM

Lightning Strike to Dural

At 4.52 AM on Sunday 23rd May, during a good storm over the Sydney region, one strike took a liking to the 11 kV street mains which reflected into the low voltage side of the system. It was items like the beacons, repeaters and packet which felt the effect, in most cases the mains fuses in the power supplies. These were soon restored at broadcast time and then the remaining faults showed up. Some of the ICs in the console switching, the control functions of the 6 and 2 metre SSB, and a driver in the 70 cm repeater, the power supply of the 10 metre beacon and a packet TNC and control card seemed the worse for wear.

Packet was soon restored thanks to the loan of equipment from members. A new RF lineup was grafted into the 70 cm repeater giving it a 15 watt output in place of its previous 8 watts. It was also an opportunity to tidy up the 10 metre beacon which had just been strung together more than a decade ago to get this service on air. With a new power supply and housing it was returned to service on July 4th, slightly closer to its assigned frequency of 28.262 MHz 6 and 2 SSB had a few faults to sort out and should be restored to service by now.

A new solid state unit has been placed in service on 52.525 MHz to allow the poor old BS50 base to assume back up duties. Work is being undertaken to increase the power on the 3593 kHz evening SSB service. There were times earlier this year when the signal became lost in the crowded band.

While on the subject of Dural and the broadcasts we are still, at the time these notes were compiled, seeking a Broadcast Co-ordinator. It is a big job for one person so perhaps a team of people could form a group under a Co-ordinator and compile it on a roster basis. In the meantime various councillors are putting the broadcast together but this is eating into time they could be devoting to

Council matters. Please contact the Divisional office if you would like to assist as a team member.

Happenings

A reminder that the Wagga ARC and the Twin Cities Radio and Electronic Club will be hosting the 2nd Riverina Field Day at Wagga over the weekend 14 — 15th August. See the insert in the July issue of AR. This is also the RD contest weekend and VK2 would like as many operators as possible taking part to help the State score. Broadcast this weekend at 5.15 pm Saturday with the news and opening address.

The Division will be holding exams this month, applications close August 12 with the exam on Sunday afternoon August 29th.

The next Trash and Treasure will be held in the Parramatta carpark Sunday afternoon the 26th September..... Further to the broadcasts please note that in order to forward on material to the compiler, FAXs should be sent by noon on Friday to 633 1525 rather than the previous later time of 6 pm. Likewise with material by packet, send early. ..... It is just over 25 years since permission was given by the Department to establish repeaters ..... The Sydney Progressive Amateur Radio Club — SPARC — was formed last year with the aim of acquiring and restoring the old radio installation, the one time monitoring station at Middle Head, Mosman.

Council

In June Bob Lloyd-Jones VK2YEL found he had to retire from active involvement on Council. His place as Secretary/Treasurer has been filled by Roger Harrison VK2ZTB and John Simon VK2XGJ co-opted to fill the vacancy. The distribution of major Council portfolios for this year are as follows:

Publicity:- Roger Harrison VK2ZTB, Julie Kentwell VK2XBR; Parramatta property:- John Robinson VK2XY, John Simon VK2XGJ; Dural property:- Tim Mills VK2ZTM; QSL Bureau:- John Robinson VK2XY; Membership Services:- Roger Henley VK2ZIG; Education:- Terry Ryeland VK2UX; Federal Councillor:- Roger Harrison VK2ZTB; Alternate Federal Councillors:- Terry Ryeland VK2UX, John Robinson VK2XY; NTAC Co-ordinator:- Caesar Miranda VK2TCM.

New Members

Our usual warm welcome is extended to the following who became members of the NSW Division during June.

S.	(Shannon)	Bathis	VK2JSB	Mortdale
B.	(Ben)	Braithwaite	VK2GHY	Thirroul
J.R.	(John)	Cameron	VK2EJC	Captains Flat
A.W.	(Arthur)	Clarke	VK2GOD	Little Bay
P.	(Peter)	Cox	VK2TCI	Port Macquarie
M.F.	(Mark)	Grogan	Assoc	Toukley
F.	(Frank)	Hunt	Assoc	Parramatta
A.	(Allan)	Jackson	VK2DAM	Leeton
R.D.	(Richard)	Kidd	Assoc	Orange
S.	(Shigetoh)	Kumagai	Assoc	Gordon
E.	(Emil)	Lahodny	VK2FHC	Jindabyne
J.	(James)	Morris	VK2GVA	Manly
V.	(Val)	Pinczewski	Assoc	Northbridge
D.R.	(David)	Plumb	VK2DRP	Bega
D.M.		Reed	Assoc	Valley Heights
J.	(John)	Rogers	VK2ACW	Armidale
G.H.	(Geoffrey)	Schuler	Assoc	Baulkham Hills
R.E.	(Raphael)	Shammay	Assoc	Bondi Junction
J.	(John)	Vittorio	VK2MMX	Penshurst

5/8 Wave

Rowland Bruce VK5OU

The June meeting was held on a bitterly cold night, by Adelaide standards at least, the day after the winter solstice. There being five Tuesdays in the month it was a buy and sell night and, as usual, Peter Maddern did an excellent job of not only disposing of some junk (I bought some of it), but also keeping us entertained for an hour or so. There were some absolute bargains to be obtained, too. Where do they all come from? The next buy and sell will be this month, August 24th. See you there?

I was handed a copy of a request which may strike a chord with some readers of this column in other states as well as in South Australia. Neville, who can be contacted by 'phone on 08-274-1103, is researching the history of radio manufacturing in South Australia during the 1920's and 1930's. Anyone working in that industry, and especially in "Gladiola," is asked to ring Neville on the above number.

I see that the ever increasing load on the Equipment Supplies Committee (sales have grown by 550% in the last three years) has caused them to expand their group. They have a new address, PO Box 789, Salisbury, SA 5108. Please do not send mail to the WIA address in Adelaide as this could result in considerable delays. The telephone and fax numbers are identical. I guess this means there is not a dedicated line; or do they have an automatic switch? Whatever, it is 08-287-2868. Talking of things "automatic," the VK5WI Packet on 420.1 MHz now has a 4800 baud port installed.

We have yet another member from the Northern Territory, Alan Baker, VK8ZAB. Welcome to the WIA. It really is good to see the numbers of Territorians joining of late. Could it be a spin off from the SEANET Convention last year?

ar

How's DX

*Stephen Pall VK2PS**

Solar activity remains very low with the solar flux number dropping down on some days to near 80. The 40 — 80 — 160 metre bands performed adequately under the difficult circumstances and quite a number of contacts were made with DX stations. A small group of VK DX-ers on 1832 kHz has so far had 49 successful sessions with North American counterparts across the Pacific. According to G8KG as quoted in the RSGB "Radio Communications" magazine, the Brussels SIDC March 1993 Bulletin made a tentative forecast of the timing of the forthcoming minimum of our present solar cycle (22) as arriving probably between November 1995 and September 1996 which would mean an unusually short cycle lasting between nine and ten years.

It is quite usual to see references to the "11 years cycle", however the past 14 cycles fall into two distinct groups. Seven "long" cycles (9 to 14 and 20) with a mean duration of 11.7 years and seven "short" ones (8, 15 to 19, and 21) with a mean duration of 10.2 years, the shortest of these lasting 9.6 years.

Spratly Islands — 9M0S

Martti Lane — OH2BH — sent a detailed report to various DX publications about this recent activity. Here are a few highlights. Due to last minute changes the expedition flew in on to a 1500 foot air-strip which is located on Swallow Reef (Layang-layang), itself a small islet of 2000 feet by 400 feet.

Due to weight and other restrictions the amplifiers were left behind. At one stage there were two stations on the 20 metre band simultaneously. The six days activity resulted in about 37,000 QSOs of which more than 10,000 were on the WARC bands. The expedition enjoyed the presence and the safety protection of the Malaysian Royal Navy and they are grateful for the assistance given by various Malaysian Government agencies, the Malaysian ARS (9M2), and the Sabah ARC (9M6).

Libya — 5A

The saga continues. It was in June AR when we reported last about Romeo's 3W3RR activities. Romeo did not attend

the Dayton Hamvention but he was reported on the air on the 5th of June as LZ/3W3RR and as LZ/AH0M on the 8th of June. (Romeo's US callsign). On the 11th of June it was said that he hoped to be active "within 3 days". 5A0RR showed up on 20 metres on the 16th of June working with a 100 kHz wide split which angered many users of the band. He was also heard on 20 metres CW with weak signals. Then he disappeared. Rumours are floating around, but none substantiated. It is said that Romeo is "on a business trip " in Libya. Others seem to know that the Libyan authorities have restricted his activities to a small portable or mobile operation. A number of Europeans have worked him on 80 metre CW (and SSB) and 20 metres SSB. The last reported CW activity attributed to him was on the 18th of June. As usual, some of Romeo's operations are controversial. His North Korean activity is still not recognised by the DXCC, and it is alleged that physical proof of his presence in North Korea is still required. Yours truly is still waiting on his QSL cards from the Myanmar (XY0RR Sept 91) and Afghanistan (YA0RR Dec 91) activities.

Dick Smith — VK2DIK — Balloon Crossing

The Transcontinental non-stop balloon attempt was a great success. Dick and his co-pilot John Wallington lifted off from Carnarvon (VK6) on Thursday, 17th of June at 0052 EST (1452 UTC on 16th of June) and after 40 hours and 23 minutes of flying at speeds up to 188 km/h and at heights up to 22000 feet (6707 metres) they landed at the small village of Tabulam (VK2) 40 km west of Casino (lat 28 degrees 25 minutes south and long 152 degrees 55 minutes east) at 1715 EST 18th of June (0715 UTC). The total non-stop distance was 3640 km (1965 nautical miles) thus improving on all seven previous attempts.

The interest and cooperation of all the VK radio amateurs who were following the balloon's progress on 20 and on 40 metres was commendable. There were hundreds of stations listening and keeping the frequencies clear. A number of volunteer relay stations offered their services which were gratefully accepted. Many contacts were made with the Mission Control station VK2AWI. Some individual amateurs even managed to have a few short contacts with Dick himself. Amateur radio in general received a good media coverage. Special event station VI2AUS was on air a few hours after the landing and managed almost 2000 VK and international contacts on various bands and modes in 13 days. The special activity ended at 2359 UTC on the 30th of June. QSLs to VK2WI with a SASE.

Eritrea — E35X

The DXpedition of one Japanese and three Norwegian radio amateurs started at 1830 UTC on 1st June and closed at 0620 UTC on the 9th of June. About 20,000 QSOs were made with about 125 countries on 10, 15 and 20 metres SSB and CW, but there were some contacts on the 40, 80, 160 metre bands and a few RTTY QSOs also. A three day amateur radio seminar was held at the Eritrean Telecom office with about 15 participants, followed by a 4 days seminar at the Asmara Technical School with 35 participants. A number of ARRL manuals, lecture notes and a complete amateur station were left behind for the Asmara Technical School Radio Club which has 27 members. QSLs to Ruth Tollefsen, P0 Box 17, Tveita, N-0617, Oslo. One card per QSO please.

Future DX Activity

- Be prepared for some interesting activity from Christmas Island, VK9X in August. It is possible that one well known DX-er with a special call will operate from there.
- There are now two new operators on Svalbard Island. JW6MY is LA6MY mainly on CW for about 4 months. QSL to his home call. JW6LIA is Ove and QSL goes to LA5NM.
- ON4QM will not go this year to Sao Tome & Principe Islands. Instead he will have a Pacific tour in August.
- There are now a number of operators on short assignments in Somalia. KN4NL/T5 was heard, and Bert SM3HLL is active as T5HLL. QSL to home calls.
- ITU has allocated the Z3A to Z3Z callsign block to Macedonia. Some Macedonian amateurs are already using the new prefix. So far Z31PK (ex-4N5PK), Z31FK (ex-4N5FK), and Z32ET (ex-YU5DRS)have been heard.
- Iran. 9D2CW will be active for about 2 years.The Iranian nationals receive the EP prefixes, foreigners are issued with 9D2 calls.
- Wake Island KH9. A student team from the California Polytechnic State University Amateur Radio Club (W6BHZ) will be active from this island from the 31st of August to the 10th of September. QSL will go to Oklahoma DX Association, P0 Box 88, Wellston OK, 74881, USA.
- Penguin Islands ZSI. A group of German operators are planning to activate these islands from the 25th of July to the 3rd of August.
- The Kyoto Amateur Radio Club will be active with a multi operator DXpedition on Belau, KC6. The nine Japanese operators all have individual KC6 callsigns. QSL to JA3OIN.

Interesting QSOs and QSL Information

- CO2VJ — Juan — 14002 — CW — 0440 — May. QSL to I0WDX, Cesare Casaroli, Piazza Conti 2, I-00010, Poli, Italy.
- C91J — John — 14014 — CW — 0622 — June. QSL to W8GIO, Paul R. West, Rt 1, Box 140-42, Bunker Hill WV, 25413, USA.
- AL7MX — Kevin — 1832 kHz — SSB — 1200 — June. QSL to Kevin G. Forster, P0 Box 877326, Wasilla AK, 99687, USA.
- SV5TS — Vasilis — 14276 — SSB — 0619 — June. QSL to Vasilis Argyris, Demokratias 146, GR-85106, Paradisi, Greece.
- YI1DZ — Diah — 14251 — SSB — 0552 — June. QSL to The Manager, P0 Box 7361, Baghdad, Iraq (Note — send IRCs only).
- VQ9AC — Jim — 7008 — CW — 1229 — June. QSL to WN80, James L. Wilson, NSGA Adak PSC 481, Box 537, PO AP, 96505 USA.

- ZL4FNP — Brian — 14195 — SSB — 0300 — June. QSL to The Manager, P0 Box 1260, Invercargill, New Zealand.
- 7Q7XX — Kay — 14222 — SSB — 0615 — June. QSL to JH3RRA, Shinya Takenaka, Box 21, Katano, Osaka 576, Japan.
- HH2B — Bernard — 14247 — SSB — 0504 — June. QSL to Bernard Russo, Box 38, Port au Prince, Haiti, Caribbean.
- T95X — Slavo — 14192 — SSB — 0541 — May. QSL to 9A2AA Tomislav Dugeo, Box 255, 58001 Split, Croatian Republic.

From here and there and everywhere

- Joe K8JP QSL Manager for Ed, 3CITR, advises that Ed will be operating from 3C -Equatorial Guinea until September on various nets. You might hear him also on slow CW and RTTY.
- Neil VK6NE the VK9 and VK0 WIA QSL Bureau manager advises that Tony VK9LA of Lord Howe Island has now a credit with the Bureau and cards received by the Bureau will be forwarded to him. Bill VK4CRR also established a credit with Neil, for the receipt of VK9LD cards through the Bureau.
- Steve HB9DX wrote to me that one US Dollar does not cover the cost of postage from most European countries to places outside Europe. In Switzerland the airmail postage for a letter to another continent is Fr 1.80 whilst one gets only Fr 1.40 for one US dollar. Other DX publications mention Germany and Austria where postage costs are high. It seems to me one should not send "green stamps" but one IRC per reply. According to the wording on each IRC, "the coupon is exchangeable for a stamp or stamps which represents the minimum postage for a priority item or an unregistered letter *by air* to a foreign country". The operative word here is *exchange for stamps* and not for money. However it is well known that some QSL managers are exchanging IRCs for money either in their own country or they are selling the IRCs via mail to other amateurs at a discounted rate therefore they are converting IRCs into money. One tends to forget that only post offices are licensed by the Universal Postal Union to sell IRCs. Experience shows that some QSL managers feel that they are entitled for an additional "extra" to cover incidentals such as the cost of printing of QSL cards for the DX station, the cost of airmail envelopes where no envelope is supplied or where only address labels are at hand.

  All this confusion about the cost of direct QSLing by managers and individuals could be cleared up if those who are involved in this direct system of QSLing would declare their policy openly in advance. They should state their "fees" for the service they provide as distinct and as additional to the cost of the postage. The very often quoted F6FNU QSL service policy at least is clear: he charges two green stamps for the return of the QSL card and that fee includes return postage. On the other hand he does send you the card. However some ethical problems still remain to be solved. One hears the argument that amateur radio is not about making money but it is a voluntary hobby. One however should make the distinction between the QSL manager (with an administrative service role and who is an intervening third party to the transaction) and the DXer who handles his own QSLing. Another point of view: there are major, openly sponsored DXpeditions, there are "diplomatic" DXpeditions (to open up a new country for amateur radio), there are freelance DX groups and there is the last one in the line, the lone single DXpeditioner. Among these groups what is the proper, equitable and fair way of QSLing? Of course there is also the problem of QSLing by DXers via the QSL Bureau system. It is a known fact that some DXers or DXpeditions very rarely send a reply card via the Bureau system. It is hoped that the September DXAC meeting when poor QSLing practices of DXers will be discussed will lay down some clear guidelines to which DX-ers who seek accreditation of their activity for DXCC purposes will have to adhere in advance in writing. Then there will be no more misunderstanding.
- N9MDW/P/5N6 has now returned to the USA.
- 7Q7RM Ron says that his QSL manager is G0IAS.
- The DXCC desk advises that the T5/KF6BL activity is now accepted for credit.
- Christy de Kock ZS8MI, Marion Island, is active. He will stay on the island for the next 18 months. He has checked into the ANZA net (0530 UTC 21205 kHz), into the European DX net at 1500 UTC on 14243 and into the Spanish net at 1530 UTC on 21200 kHz. His home call is ZS1CDK (not in the callbook), but he has now acquired a post office box for the expected extensive mail. He requests two green stamps for an ordinary QSL card and 3 green stamps for a special card. His postal address P0 Box 244, Stellenbosch, Cape Province, 7599, Republic of South Africa.
- "Jo" Harris — VK2KAA — 59 Westbrook Ave, Wahroonga, NSW 2076, the VK2 Division's historian, wants any VK2 QSL card for the divisional "History of VK2 Callsigns" collection. She is also looking for a VK2 amateur as a curator for the Division's QSL card collection. If you feel you can assist, please contact her.
- The ITU has a new 1 kW beacon in Norway — an omnidirectional antenna — with the callsign LN2A. It will be a useful tool to check propagation on various bands. Time (UTC) and frequency schedule is as follows: 0020 and 0040: 14405 kHz — 0424 and 0444: 20945 kHz — 0828 and 0848: 5470 kHz — 1232 and 1252: 7870 kHz 1636 and 1656: 10407 kHz.
- Do not expect to receive the AH1A cards before September/October. They are being printed in Belgium.
- After very long negotiations the Canadian Radio Relay League and the Canadian Amateur Radio Federation have finally merged to form the Radio Amateurs of Canada (RAC).
- Alain, ZD9CQ is on Gough Island until November. He is active on 20 and 40 metres on SSB. QSL to ZS6AS.
- Andy, ZD9BV and his wife Lorraine ZD9CO are the only amateurs on Tristan da Cunha. They operate only until midnight local time, when their generator power goes off. You can find them on 21260 kHz (1830 UTC), 21313 (1800 UTC), 21355 (1930 UTC). QSL to W4FRU.
- The DXCC desk advises that the backlog of unprocessed applications at the end of May was 278 with 48,803 QSL cards.
- The DXCC desk has announced that QSL cards from 4N4 and 4O4 stations will be acceptable for DXCC credit for QSOs up to the 11th of May. QSOs from 12 May onwards must be with T9 stations.
- An international group of amateur operators has targeted Pratas Island as a possible new DXCC country or as a new reference number in the IOTA program. The island lies in the South China Sea and has a Taiwanese military base. The callsign is reported to be BV9P.
- Belize, V31BR will be active from the 9th to the 16th of August on the usual DX frequencies and on the Southern

Cross DX net, 14226 kHz at 1100 UTC. QSL to N5FTR.

- LU1ZU is now active from Argentina's Esperanza Antarctic Base (63°24' S and 57° 00 W).
- Ken, WA40BO is in Chad with the callsign TT8OBO. He was heard around 2000 UTC on 14256. QSL to home call.
- The JH1AJT proposed Eritrean DXpedition is now scheduled for the end of July or early August. Incidentally, the DXAC has not yet decided about the DXCC status of Eritrea.
- Mike, VS6WV will be visiting Cambodia on a regular basis and from time to time he will be on the air as XU6WV. QSL goes to K0TLM.
- If you change your address and you want the information to be correct in the "International Callbook" please write direct to: Radio Amateur Callbook, P0 Box 2013, Lakewood, NJ, 08701, USA.
- If you are lucky, you might find Michael, OX/N7PQO on the bands, operating from the Greenland Ice Sheet Project until about the beginning of August. QSL to AA7UT.
- Duane, WV2B and Art WA2UJH were active from St Paul Island as WV2B/CY9 and as WA2UJH/CY9.
- ZK1AJJ/ZK1 was active from North Cook Islands. For months previously he was on Pitcairn Island. QSL for this activity goes to JR2KDN.
- The RSGB International HF Convention will take place at the Beaumont Conference Centre, near London's Heathrow Airport on the 8th to the 10th of October.
- Ron, ZL1AMO was active from Fiji and from Rotuma Island as 3D2RW/R.
- St Peter & St Pauls Rocks. The NATAL DX Group of Brazilia is planning a DXpedition in January/February 1994 to these specks of islands in the Atlantic.

QSLs received

CM2CK (8W op) — KG4HG (2W op) — VU7SF (14W op) — TI4CF (4W TI2CF) 4N4CX (4W WA4WTG) — 3C1TR (6W K8JP),

Note "Murphy's" misprint in "AR" July 1993 issue — Bosnia Herzegovina, new prefixes. "National Soviet" should read "National Society".

Thank you

This column would not have been possible without the input of the following contributors: VK2DID — VK2KAA — VK2KFU — VK4BCP — VK4DA — VK4OH — VK5WO — VK6NE — HB9DX — K8JP — WA4WTG and the following publications: QRZ DX — The DX Bulletin — and the DX News Sheet, Many thanks to you all, ***Good DX and 73.***

**PO Box 93, Dural, NSW 2158*

ar

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

D M (Donald)	CLARK	VK1CD
W (Bill)	DAY	VK2BDQ
O E (Orme)	COOPER	VK2CP
J E (Jim)	OCKENDEN	VK2UZ
M W (Mervyn)	COLLETT	VK2UMC
S G (Stan)	TAYLER	VK3DHN
J A (Joe)	ACKERMAN	VK4AIX
B H (Bruce)	BUSSENSCHUTT	VK4OR
G (George)	BURGESS	VK5CGB
F C	LAMBERT	VK6FL

Orme E Cooper VK2CP

Mr O E Cooper, BEM, VK2CP died 15th June 1993. Orme was in both the amateur and commercial communications fields for 60 years, retiring as Manager of the big OTC International Switching Centre at Paddington, Sydney. He was awarded the British Empire Medal for services to telecommunications.

Orme's knowledge was prodigious; landline and radio telegraphy and telephony, repeatered submarine telephone cables, all phases of amateur work as well. He was both a "hands on" man as well as a competent administrator. At one time AWA had him managing a broadcast station.

I first read of him in the old "Australasian Radio World" magazine about early 1939 when it recorded his having worked 17 US amateurs in one month on 20 metres using 2 1/2 watts of AM phone. As soon as amateur activity resumed after WW2 Orme and his friend the late Dr Leo McMahon VK2AC commenced experimenting with SSB. After overcoming receiver instability due to heat drift in the valve equipment they were credited with being the first VK2 hams to set up a circuit in this mode.

Although dogged by ill health Orme never faltered; he was unstoppable and was active right until the end. Charlie Peter will be sadly missed.

W Easterling VK4BBL

Colin C Paterson VK2BCP

Col passed away on Monday 31.5.93 after a long and trying illness. After serving in the RAAF — three years as a Flying Instructor — he became a Master Plumber and set up his own business.

Upon retirement to Wiseman's Ferry he took up Amateur Radio obtaining his novice call VK2NEU in 1977 and his full call a couple of years later. In addition to many other contacts he operated a net every evening at 1700 hrs EST on 80 m. I first joined the net in January 1979 but did not become a regular until 1982 by which time Col had suffered a stroke. Notwithstanding his handicap he maintained the net with increasing difficulty until the control was taken over by Les VK2LW.

Early in 1992 he and wife Judy moved to a Unit in Nerang, Queensland, in order to be nearer their married children. He acquired a new callsign VK4CCP but unfortunately was never able to use it. Shortly after the move his condition became worse until he "called it a day" at 8.00 pm on 31st May.

He is survived by his loving wife Judy, children Craig and Judith with spouses Robyn and Ashley, and grandchildren Kjell and Heath, to whom the members of Col's Net particularly offer their sincere sympathy.

Franklyn Pain VK2DYP

Clive Cooke VK4CC

After leaving school during the mid nineteen thirties, Clive joined Stromberg Carlson as a Tester. He worked with this Company until the WW2 years when he left to join the RAAF. He served as a W/T Navigator with 30, 7 and 28 Beaufighter Squadrons. After leaving the Air Force at the end of WW2, Clive opened a radio sales and repair business in the suburb of Windsor in Brisbane. Sometime later he disposed of the business and joined the PMG Department, Telegraph Branch as a Telegraphist. From this Branch he was later posted to the Wireless Branch and subsequently became a Radio Inspector.

After appointment to RI the Department employed him in Type Testing of particular categories of electronic equipment. The next move was to the Division of Frequency Allocation. Shortly after this appointment, Clive obtained twelve

months leave of absence to join one of the early post WW2 expeditions to Macquarie Island in the Antarctic, as Radio Communications Officer. At the conclusion of the Expedition, he returned to the Wireless Branch where he remained until retirement during the mid nineteen eighties from the Branch which in the meantime had been restructured to the Department of Communications.

Clive is survived by his wife "Jo" (Mavis), son Peter and two daughters.

Our sympathies to "Jo" and the family in their great loss. The amateur fraternity will also miss this most worthy member.

Theo Marks **VK4MU**

Joe A Ackerman VK4AIX

Joe became a Silent Key on 4th June 1993. Aged 82 years.

Joe was a keen DX man and kept meticulous records. His awards indicate how he persevered until he gained an award. In retirement Amateur Radio and DX was his life.

Joe was born at East Orange on 12th April 1911, the eldest of seven children. He left school at 14 years of age and became a messenger boy with the Post Office at Dubbo NSW. Later he worked on telephones at Edgecliff NSW.

Joe joined CMF Signals in 1931, was called up on outbreak of WW2 and commissioned as a Signals Officer in 1941. He served in the CMF in Signals for 27 years.

He retired from the GPO at 65 years of age, as Assistant Superintendent of the Sydney Mail Exchange.

Pre-war Joe became a "HAM" and was a member of the Lakemba Radio Club. He became Secretary of the Hurstville Amateur Radio Club.

Post war he was QSL Manager of the Gold Coast ARC, Contest Manager of the VK4 Division of the WIA, and for two years was the Sub-Editor of the "Amateur Radio" magazine.

Joe was a staunch Mason and served as 1st Principal of Liverpool NSW Royal Arch Chapter.

To me, Joe was a great friend. His dry humour was something to hear and experience. Joe and his wonderful wife Heather attended all our family celebrations since I retired in 1982.

To Heather and Joe's family I extend condolences on behalf of Joe's many "HAM" friends.

We miss you Joe, but somewhere there is a place where we old "HAMS" will meet again and have a great old "Rag Chew".

Don Hopper **VK4NN**

Lt Cdr George Burgess (Ret) VK5CGB

George died on 14th May 1993 at Modbury Hospital, Adelaide a few weeks after having a Cerebral Vascular Accident at home.

George studied Dentistry at Manchester University in the UK, then joined the Royal Navy and was commissioned in 1941. He served on HMS Norfolk, Jacques Morgand, Prodigal, Tirade and Deersound.

He was a founder member of his local Round Table, played Rugby for Keswick, and formed a Sea Cadet Unit. He was also a Special Constable, enjoyed many sports...tennis, badminton, swimming, sailing and climbing. He travelled over much of Europe with his wife Sue before coming to Australia.

Over here he continued in Dentistry and served with the Naval Reserves and Sea Cadets. Latterly he became interested in amateur radio, computing, fishing and french polishing and found time to assist in local community services.

For many of us George will be more than widely remembered as the Secretary for RNARS Australia and Manager for SA. He had CW/DX friends worldwide and controlled the RNARS/VK Monday evening net on SSB.

He will be sadly missed by all who knew him, especially by Sue and family to whom we extend our deepest sympathy.

Derek **VK5AFP** and members of RNARS/**VK5**.

ar

Over to You — Member's Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Skeds with Brazil

During the recent visit of many international Rotarians, one in particular from Brazil met with me to discuss amateur radio. He expressed an interest in making contact with Australian amateurs. Details are as follows:-

His club:- Grupo Hermandad Radial Universal "Caballeros del Aire", Ruben S R Arza, PO Box 38, Montevideo, Uruguay.

Personal details:- PY2PRR, P R Romanoschi, Rua Candido Brasil Estrela, 321, CEP.15.054.220, Sao Jose Do Rio Preto SP Brasil.

Club times suggested:- Sat/Sun, 19 hrs GMT 21.275 MHz, 16 hrs GMT 28.775 MHz, 22 hrs GMT 14.275 MHZ.

Gordon Dawe **VK3GAD**
5 The Close
Frankston VIC 3199

Or a Belgian Penfriend

I have received a letter from a Belgian SWL who wanted information about our Zone 29 award for publishing in CQ/QSO. This is a magazine of the DIG, a German awards club. The letter's author asks could I publish a note in our magazine asking for penfriends for him. So:-

WANTED

Belgian SWL would like VK pen-friends. Interests include chasing awards, radio general, family, international friendships. Egbert Hertsen, Postbus 85, Mechelen 2, B-2800 Mechlen, Belgium.

Nell Penfold **VK6NE**
2 Moss Court
Kingsley WA 6026

Following Dick's Balloon

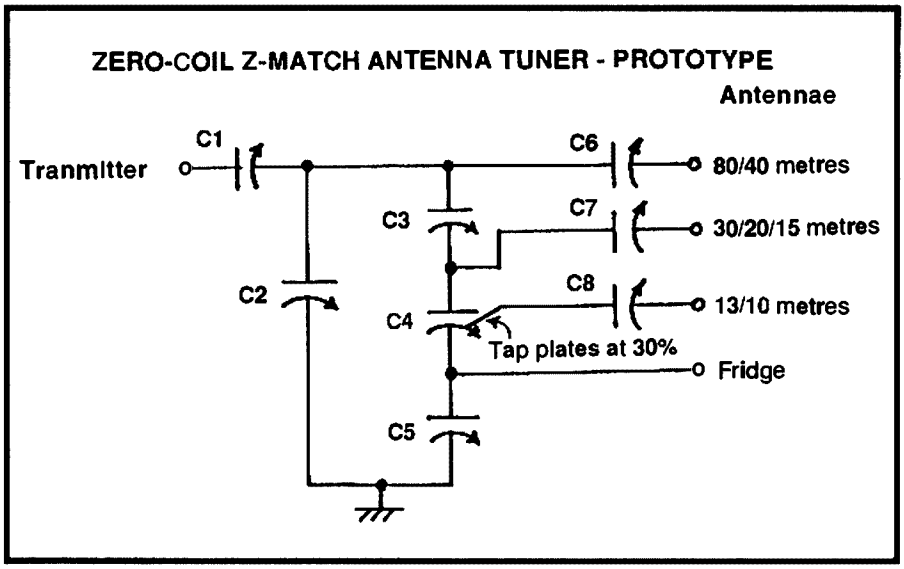
The Dick Smith Flight was a "ONE OFF" and a change for a number of Hams from giving weather reports, signal strengths and types of gear. It was quite AMATEURISH and therein was its interest. The first day we had heights and altitudes, local and GMT time, headings in magnetic and true, and therefore breakers wanting to know which was correct. Second day it was much better. A plus to all, and a word to the WIA. Very few people worked Dick direct. Fair enough if they would like a QSL card. But surely the WIA should make a comment about everybody else who thinks they are entitled to a card by just working or talking to the ground control station. Even the famed Drover's Dog could do that! By the way, did anyone else besides me hear QANTAS 5 call VK2DIK on 20 m or was it only me? A plus for Ham Radio. A "well informed" VK4 said they were flying a Great Circle Track (?) and another said he was on CW (?).

G W Lanyon **VK2AGL**
16 Hilton Avenue
Roselands NSW 2196

Single-Coil Z-Match Tuner

As a builder of the 2-Coil Z-Match I looked forward to the second part of the article by Lloyd Butler with a particular interest. I had hoped to find the Perspex coil former properly drilled. Shock...Horror — No change!

As you should know one row of holes must be displaced axially with respect to



the other by half of one pitch in order to match the helical form of the coil.

This serious error was plainly evident in the published photographs of the 2-coil Z-Match; the coils were squashed out of shape. The coils in my Z-Match have, of course, correctly drilled holes.

While on the subject I must admit to lamenting the loss of one coil — for aesthetic reasons. However, as always, one must bow to development and progress. I have therefore anticipated your next move by drafting a Prototype Zero-Coil Z-Match.

As you see from the enclosed circuit diagram there are no coils (of course), and no switches; but there are eight (8) variable capacitors each with its own vernier drive. I should warn enterprising experimenters that tapping down the plates of C4 is difficult — I destroyed 15 capacitors doing so.

When study of the Single-Coil Z-Match is completed (in 1996?) I'm sure that the next phase of development will deserve equal in-depth analysis.

Geoff Combes VK4GWC
Lot 2 Kirbys Rd
Palmwoods Qld 4680

More on Kingsley Radio

Having followed with great interest the article in your excellent magazine relating to the late Howard Kingsley Love, I wish to tell you this story, which relates to myself.

Having fooled around with wireless since the early 1920s to the rig after the war being a 100 TH modulated with a pair of 809s Class B, somewhere along the line I met and became associated with Howard Love. Maybe at this time I was little more than a nuisance to him and his gang in the St Kilda Road workshop.

However the result of this association made available to me the Kingsley AR7 receiver serial numbered 2S for Sugar. Howard himself had the first set number 1S and I had number 2S. The serial numbers distinguish them from the sequence of those supplied to the Defence Department.

Whilst in contact with a ZL ham named "Jock" the subject of the AR7 and its similarity to the American National HRO was discussed. Jock explained to me that he was establishing somewhere in the centre of the North Island of New Zealand a Museum of wartime equipment and asked me to put a price on the AR7 Serial No 2S. I had the set crated and sent to Jock free gratis and for nothing for his museum, where it now resides. I later received a letter telling me that the members of his club had re-conditioned and serviced 2S and it is operating excellently.

I do not know what became of 1S more than I know the full handle of Jock or his QTH. Maybe one of our VK lads may raise this subject with the ZL boys and determine the present home of Kingsley AR7 number 2S.

I could, of course write much more but the present article on the AR7 is being covered excellently.

John Taylor VK3AJT
2 Western Beach
Geelong VIC 3220

More Morse Stories

Strange but true, I can personally confirm similar experiences as expressed in Members" Opinions in July "AR" concerning Bob (VK3SK). After joining the Marconi Company at West Ham in 1952 I was ushered to a room to await further developments. When you were selected to crew a ship, your surname was broadcast in Morse via an internal intercom unit, followed by a single letter denoting the room to which you had to report. Nobody missed the ship.

Secondly re Tom (VK5TL). A first AIF gent by the name of Lew Seccombe showed me a method of monitoring distant LF Navaid identifications during periods of QRN and weak signals. He used to place the palm of his hand on the front of the earphone, turn it around and place the rear of the phone on his cheek. It worked, and I used this unorthodox method on many occasions.

D Reynolds VK2ANW
9 Arterial Road
Killara NSW 2071

Piratical Prostitution?

I refer to my letter published in the July issue of AR under the title of "Presumptuous Pirates". Feedback indicates that my claim of the prostitution of amateur radio should be clarified.

I define prostitution as the selling of favours for money.

My claim of the prostitution of amateur radio is justified by this example:

During February an American vessel in Gizo (Solomon Islands) had a number of phone patches through a Northern New South Wales amateur to his wife Joyce in the Cairns Base Hospital and later at the CWA hostel. When these phone patches were being arranged the American station indicated that he would pay for the calls from NSW to Cairns (it being cheaper than Gizo/Cairns). These phone patches ceased when the wife left Cairns and returned to Gizo. On 22/2/93 the Gizo station was advised by his VK4 friend that the cost of his phone patches was $A39.69 and arrangements were made for him to pay by cheque.

Fact: International Radio Regulations limit third party traffic to items of a technical nature or of a personal nature of such unimportance that recourse to the public telecommunications network is not justified.

Question: Does this mean that the station in Gizo and the NSW station consider Joyce's state of health did not warrant recourse to the public communication network?

Or does this mean that one station is paying for favours granted, and the other station selling favours?

Which takes me back to my definition of prostitution.

What do you think?

Deane Laws VK4ALN
27 Awoonga Ave
Burleigh Heads Qld 4220

ar

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

A Few Pointers to Help with FSK and RTTY

FSK Morse This method of sending Morse code often produces confusion to monitoring stations. It is difficult to receive the code when listening to both the carrier and shifted carrier. To read correctly, simply switch in a narrow filter and listen to the shifted carrier only.

RTTY Many intruders on amateur bands use radio teletype. For privacy they seldom use the standard 5 bit Baudot/Murray code format. Computer generated "on-line cypher" machines also make some RTTY codes unbreakable. The patient monitor will sometimes be rewarded when the operator omits to switch in the cypher machine.

Beacons Single letter beacons are becoming a numerous commodity. We have "V, K, U, N, T, A, H, F" and possibly many more not listed as yet by observers. It seems they were first noticed about 1985. Where do they originate? Some, we know, come from "old Russia", now CIS. These signals, although mainly weak, are easily identified by a single letter sent in FS Morse telegraphy, usually using 1000 Hz shift. Two families of beacons spread between 2 and 30 MHz transmit these unusual signals.

Extensive listening by a number of investigators has suggested the "K" beacon is located near Petropavlosk on the Kamchatka Peninsula on the Pacific coast of Siberia. The "U" beacon is thought to be in the general area of Murmansk-Amderma on the north coast of the Arctic. It is surmised that these beacons are used for marine service by the Soviet fleets, but the ultimate purpose of the signals is open to question. Further monitoring of the subtle frequency shifts and data bursts of these beacons is required.

High frequency single letter beacons are not random transmissions scattered haphazardly across the spectrum. They inhabit specific bands and transmit in a highly structured manner. There are three families of beacons, "K", "U", and the "Cluster" beacons (more about these at a later date). The "K" and "U" beacons are FSK, and the "Cluster" are on/off (CW) keyed. The "Cluster" beacons repeat themselves, cluster to cluster.

Information from an article by W6SAI, Jan 1985.

Intruders

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Below is a recently logged list of intruders into the amateur bands:-

Summary of Illegal Intrusions for May 1993

Freq	Date	UTC	Mode	Comments	X
7002.5	200493	1200	A1A	Beacon V nav aid CIS	22
7013.5	2304	1150	R7B	3 X R7B side by side	
7017	0105	2025	xxx	Non amateur data	
7039.5	2004	1135	A1A	F Beacon + N & T CIS	13
7039.5	3004	1124	A1A	B & A Beacon + K CIS	
7039.5	1605	1005	A1A	Beacon H + C CIS	17
7049.5	220493	1211	F7B	UMS CIS	
10102	2404	1140	F2	Bell-like musical note	
14059	0605	0617	A1A	Ltrs only	
14061+	2004	0625	mni	PON,F7B,AC3 CHN	48
14078	1905	0547	AC3	Fax 120 rpm drum sp	
14110	0605	0945	F1B	+F1 cw, idling 4 kHz w +1000 Hz	
14120	1305	0440	F1B	250 Hz shift	
14140.5	150593	1150+	MXD	UMS group A1A, F1B, F1 cw CIS	
14162	1505	0937	F7B		
14170.5	0605	0600+	F1B	+F1 cw 250 Hz 3rd cyr CIS	
14176.5	0105	1000+	F1B	250 Hz+ 3rd register CIS	
14209.5	1305	0857	F1cw	Using Russian cw mxd cyr CIS?	
14210	200493	1045	A3E	H2 of 7105 distorted	
14211.5	0805	1120	F1B	Rtty	
14217.5	2004+	0630+	mxd	F1 cw, A1A, F1B, Mosc nav rad. CIS	
14250	0205	1020+	NON	Jammer 4 kHz wide	
14270	2404	0630	A3E	B/c stn French dialogue	
18106	0305	1051	F1B	RTTY	
18127	2905	0649	F2B	PICCOLO	
18135	010593	1019	A3E	B/c stn music.	
21001	2604	0500+	A1A	Beacon F, navigation aid CIS	
21031.5	2004	0050+	mxd	UMS group B A1A,F1B CIS	20
21104	1905	0601	A1A	P7A Also on 21113 MHz	
21268.5	2105	0545	A1A	Manual morse	
21283.5	2004	0645+	mxd	UMS, A1A, F1B, F1 cw, 250 Hz CIS	13
21285	2804	0845+	A3E	H3 of 7095, Asian prog 10	
21330	2005	1037	A3E	B/c stn talk on Mid East	
21315	260493	0500+	mxd	VVH mni freq used, 21314/445[53]	
24849	0105	0530	A3J	English lang, marine rad tfc	
24942	1605	0543	A1A	JPS Marine shipping tfc	
24947	1305	0200	A3E	Asian lang	
24953	1705	0845	Amtor	Non amateur..or Sitor	
24960	0105	0447	R7B		

24947 This stn has outstations answering but not on same freq's, 947 is the command stn.

Logs this month from VK'S 4AKX, 4BTW, 4BXC, 4AGL, 4JJS, 4BG, 6RO.

* *WIA Federal Intruder Watch Co-Ordinator Freepost No 4 Rubyvale Qld 4702 or VK4KAL@VK4un-1*

ar

A Packet of Packet

*Warren Toomey VK1XWT**

It's early winter as I write this introduction, time to keep inside and build new things (if you have a warm enough shack — I don't!) or to catch up on some reading. So we have a book review this month: the "Hitch-Hiker's Guide to Packet Radio in South Australia" is a wonderful resource guide to packet in VK5. My thanks to Lawrie VK1KLB for letting me borrow his copy.

I also have a short description of the Australian Rose network sent in by Barry VK2AAB, to make up for my lack of knowledge in last month's column.

Thanks Barry.

Warren VK1XWT
VK1XWT@VK1KCM.ACT.AUS.OC
vk1xwt@minnie.vk1xwt.ampr.org

The Rose Network

In last month's packet column Warren noted that he did not know sufficient about Rose to comment. However, as Rose is used in all states except one, many of the readers will have had practical experience with Rose.

But first to explain the name; Rats Open Systems Environment. The Rats is for the Radio Amateur Technological Society which is based in New Jersey USA. The author is Tom Moulton W2VY. Rose is a project of that society and is part of a suite of network programs. Rose as an X.25 network is the only Amateur network protocol based on the International Standard protocols, as determined by CCITT and ISO (International Standards Organisation) and the ISO has registered the amateur network.

Rose is a defined network, ie it does not need to broadcast node lists as the addressing, which is defined by the standard X.121, would enable any station in the world to be connected to by any normal amateur packet station provided the physical links are present. Each switch is told the direction in which each group of addresses is to be found. The addresses are formed by six digits and each Rose switch has its own unique address. The address of VK2RPH has two parts, the Data Network Identifier Code which for Australia is 5050 and the local network address 247600. This latter part is all that local users need to know. This number is in fact the STD code and exchange code for the area where the switch is installed. The Rose network internationally has decided on this method as it is discoverable for any switch in the world if you know the geographic location of the switch. A directory facility to comply with ISO standard X.300 is being prepared.

At present Rose is in operation in 35 countries and preliminary steps are being taken to link the various national and international networks. This will be done by connecting TNC2 Rose switches back to back through other networks. Not radio of course but HF or amateur satellite links are not yet available.

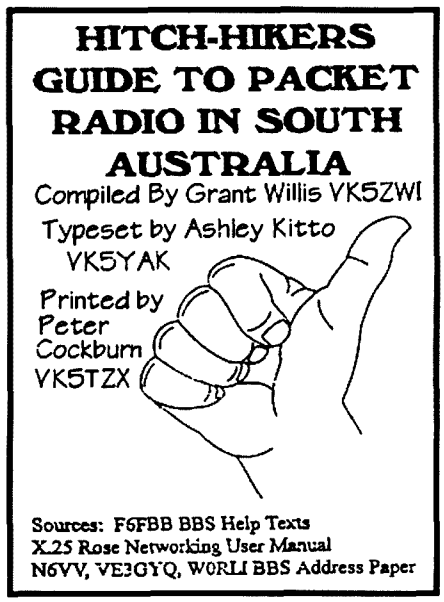
The identification of packets is clear and unambiguous. Application programs enable users to determine what stations are active at remote switches and provide information on network addresses. The X.25 protocol is only used between the switches and the users enter the network with their normal AX.25 stations.Rose can also be used as a carrier for TCP/IP networks.

Enough of the theory. What is the state of Rose in Australia at present? The network has 22 switches installed in New South Wales covering from the Queensland border to the Victorian border at Bega. The main area not covered is the south to south west of the state. The switches in use are a mixture of Paccom DR200s and Tiny 2 TNCs. The switches are linked on a dedicated UHF frequency and each switch has its own separate VHF frequency for its local area network. To achieve this two Tiny 2s are connected back to back on their RS232 connectors, or a DR200 dual port switch is used. Tests have indicated that the DR200 has up to 30% faster throughput than two standard back to back Tiny 2s.

The backbone link frequency operates at 1200 bps which speed has served its purpose of getting a network up and running. There has been criticism of using 1200 bps instead of faster speeds, but these criticisms have generally come from those not involved in actually trying to get a network up over an area many times the size of some other states. 9600 bps full duplex would cost an amount of money that is simply not available. As the financial burden would fall to a large extent on small country clubs with some assistance from the Australian Amateur Packet Radio Association it is just not possible to upgrade the network to 9600 bps full duplex. To put it into perspective, AAPRA has provided equipment assistance for all states to the value of $25,000. To have a 9600 bps full duplex network would require an additional expenditure of approximately $80,000 for NSW alone.

In South Australia a network of six Rose switches is being installed and they are about to upgrade parts of the backbone to 4800 bps. The partially installed network extends from Pt Augusta in the north to Millicent in the south. In North Queensland there are three Rose switches in the Townsville area. Western Australia has either three or four switches, but I am uncertain of the geography of the network. Tasmania has recently installed two additional switches, one in the north and one in the south of the state making, I believe, a total of four. These switches are now in the process of being linked with a separate backbone frequency with two DR200s and one back to back Tiny 2 installation.

Hitch-Hiker's Guide to Packet Radio in South Australia



The "Guide" is a 46-page booklet which describes all you need to know about the current and planned packet services in VK5. It is written in an easy to read style, with sections covering bulletin boards, ROSE and NETROM nodes, special services, and concluding with a "data" section.

Packet Introduction

This section consists of a very basic introduction to how packet radio works and what equipment is required. Places where equipment is available are listed as well as the types of information available. The TNC and TNCless systems for IBM-PCs and Commodore C64s are listed as well as some examples of terminal programs you can use.

BBS Commands

This section introduces the new user to the BBS, starting with the first-time logon sequence, then describing the basic commands through to the special services such as DOS-like operations, online satellite tracking and the local callsign service. It's an excellent thing to have lying around on paper; sometimes when you need help you can't even remember how to ask the BBS for help! Many of the commands have actual

usage examples taken from the local BBS stations.

Connecting to things

South Australia has both a ROSE network and a NETROM network. This section describes how to work your way around the networks, using digipeating, ROSE, NETROM or a combination of the above. Tips and tricks for successful "hitch-hiking" in the ROSE network are also given.

Special Services

The Special Services section covers the RTTY to packet mail gateway in Adelaide: *this service appeals to those who want to stay in a more mechanical age, but still want to send mail to friends.*

Detailed explanation is also given to the Conference Bridge services available and the TCP/IP Networking facilities that are installed in Adelaide. There is also a brief explanation of how the various protocols like ROSE, NET/ROM and TCP/IP function (extracted from the SA Amateur Technical Symposium Proceedings 1993).

Special BBS server facilities such as remote file and database servers are described and how to use the REQSAT system to send mail via the Satellite Gateways.

VKS Packet Data

The "data" section provides all the information on VK5 packet that you're ever likely to need. I'd bet most of the users have their copy stuck open to this section.

The data provided includes:

- VK5 BBS systems
- VK5 remote PMS systems
- VK5 main digipeaters
- VK5 ROSE nodes
- VK5 main NETROM nodes
- VK5 TCP/IP nodes
- Contact addresses for further information
- Addressing overseas packet mail
- VK5 packet network map
- VK5 VHF/UHF bandplan and Region III HF packet bandplans with frequencies, baud rates and callsigns throughout.

Where to Get It

The "Guide" is an excellent resource for both the new and the experienced user, and this sort of document should be made available to all packet users. Congratulations to the South Coast Amateur Radio Club for a job well done.

If you are interested in a copy of the "Guide', look for announcements in future editions of "Amateur Radio" magazine. The 1st edition has sold out and the 2nd is still in pre-production. SCARC hope to have it ready by the end of September. Cost and contact details will be released once printing is complete.

Miscellaneous

The PCBs for the DSP4 project, described in this column in May, have finally become available. The designers, Jarkko OH2LNS and Kaj OH6EH, are selling the unpopulated four-layer boards for US$40. I am acting as co-ordinator for the VK orders, so if you are interested, please drop me a note. Any new information I get to hand about the project will be passed on to DSP@VKNET on the bulletin system.

I also have the full documentation and source code for the DSP4 project from Jarkko. If you'd like a copy, please post two high-density disks to my address, plus return postage in coins or stamps.

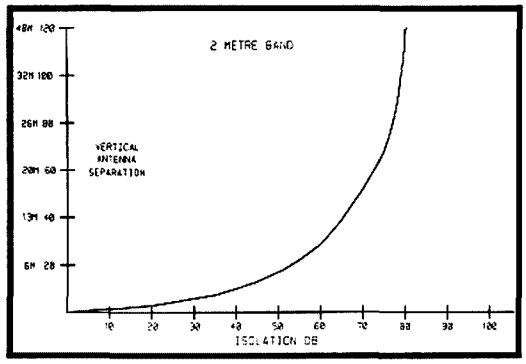
That's it for now. Stay warm and I'll see you in the next packet column.

**99 Brigelow st, Lyneham ACT 2602*

ar

REPEATER LINK

Will McGhie VK6UU explains the simple option of split antenna design for repeaters.*



When it comes to placing a voice repeater on air and the choice of aerial systems is considered, the simplest option is the split aerial design. Duplexers have their advantages but also a few disadvantages. If you have a tower of 20 metres or more, then separate aerials for receive and transmit can be the easiest way to establish a repeater. It is always possible to change the system to a duplexer design some time in the future.

With the new repeater up and running using separate antennas, valuable experience can be gained without the extra complications that a duplexer imposes. Once your repeater is performing as planned, adding a duplexer to the system can then be compared with the known split aerial design.

The big question with a split aerial design is how much aerial separation is required. There is no precise answer, as the isolation needed between the receive and transmit antennas depends on how well your repeater performs with the transmitter and receiver being so close.

With solid state repeater equipment about 80 dB of isolation is required between the receiver and transmitter port. Valve equipment can require as little as 40 dB of isolation due to lower noise output from the transmitter and better overload performance of the receiver. For this article only solid state equipment is to be considered.

The isolation figures required are about the same for 2 metres and 70 centimetre repeaters. 70 centimetre repeaters require a little less isolation (10 to 20 dB) but in general terms the two bands are the same. The big difference is that less aerial separation is required for the same isolation. Typically only one third of the vertical separation is required on 70 centimetres as compared to 2 metres.

The graph shows vertical aerial separation on a tower to achieve corresponding isolation in dB for the 2 metre band. This isolation figure means that if a 1 Watt transmitter is fed to one aerial, and the power received by the other aerial is 1 μW, then the isolation between the two aerials is 60 dB. This also corresponds to about 10 metres (30 feet) of vertical aerial separation.

As the graph shows, for isolation greater than 60 dB the vertical separation of the antennas increases greatly. To achieve 80 dB of isolation a vertical antenna separation of about 35 metres (110 feet) is required. If you want the lower antenna to be 10 metres above ground level, then the tower has to be 45 metres (140 feet) high.

Single cavity filters can be added to each aerial feed to achieve extra isolation. A full size band pass cavity filter at 600 kHz split will provide an extra 10 dB of isolation. Note that, to achieve this, a cavity filter must be added to each aerial port; that is, equal isolation both ways. You may find that more filters have to be placed in the receive port than the transmit port as the required isolation is not always symmetrical.

A cavity filter configured as a notch filter offers greater isolation than the band pass configured filter. 35 dB can be achieved with notch cavities.

As the graph shows, at 10 metres separation 60 dB of isolation is achieved. With notch cavities in each antenna feed contributing 35 dB of added isolation the total isolation is 95 dB, a workable repeater.

When planning a new repeater don't dismiss the split aerial design as it may be the easiest way to have the repeater on air with a minimum of effort.

** 21 Waterloo Cr Lesmurdie 6076 VK6UU@VK6BBS*

ar

VHF/UHF An Expanding World

*Eric Jamieson VK5LP**

All times are UTC

I'm back in harness again after an unexpected ten weeks stint in hospital. That's what can happen when you develop an allergic reaction to a particular type of dressing, and then it takes a long time to heal. Sorry I had to leave readers stranded for two issues of *Amateur Radio* but there was little I could do about it. Now, of course, I'm really pushed for time trying to sort through almost three months backlog of information, so it has been a task of many hours assembling the August notes.

50 — 54 MHz DX Standings

DXCC Countries based on information received up to 25 June 1993. Crossband totals are those not duplicated by two-way contacts. A callsign cannot be displaced from its existing position except by another with a higher confirmed number.

Column 1: 50/52 MHz two-way confirmed contacts

Column 2: 50/52 MHz two-way claimed as worked but not confirmed

Column 3: Crossband 50/52 MHz to 28 MHz confirmed

Column 4: Crossband 50/52 MHz to 28 MHz worked

Column 5: Countries heard on 50/52 MHz

Call sign	1	2	3	4	5
VK4KK	93	93			4
VK3OT	92	92			
VK4BRG	85	87			
VK2QF	83	85			
VK2BA	69	69			
VK4ALM	68	70			
VK4ZAL	68	68			
VK2BBR	54	64			
VK4TL	50	54			
VK8ZLX	45	60		1	
VK3AMK	45	47			
VK6HK	45	47			3
VK8GB	42	42			13
VK5RO	39	48		3	
VK6RO	39	39		1	11
VK1RX	39	39			9
VK5LP	35	36			9
VK3AWY	34	36			
VK3AUI	34	35			
VK3BDL	32	32			
VK3NM	31	34			
VK5BC	29	63			
VK2DDG	25	26		2	13
VK4KHZ	23	34			
VK3XQ	23	25			2
VK6PA	35	57			
VK2KAY	21	23			
VK2BNN	20	21			
VK9LG	20	20			
VK7JG	20	22			2
VK4BJE	19	25			
VK4KAA	19	20			
VK3TU	17	19			
VK2ZRU	16	19			4
VK4ZSH	16	16			
VK2ZSC	16	29			
VK9LE	14	14			
VK3KTO	11	11			
VK6OX	10	10		1	
VK5KL	6	11		1	16
Overseas					
JA2TTO	48	48			6
YJ8RG	25	25			

The next list is planned for the February 1994 issue. Copy, additions or alterations to me by 20 December 1993 please.

It appears various organisations such as ARRL and RSGB are accepting six metre QSLs from Taiwan so there seems little point in me refusing to do so. Anyone other than those listed below, having a QSL with a BV prefix and wishing it to be included in their tally above, are asked to please send me a photocopy of the card. BV is already included in the tally of VK4KK, VK3OT, VK2QF, VK2BBR, VK4TL, VK5BC and VK6PA.

John VK4ZJB has advised me that he has relinquished the callsign VK4ZJB and will in future use only VK4KK. The alteration has been duly made to the Standings List.

Six metres

A letter from Bill VK6JQ at Broome corrects two items I tendered in the March 1993 issue of AR. One — that he did not have the first VK contact with S21ZE, although he heard the station operating as a beacon on 50.115 at 1258 on 8/10/92, he was unable to get anyone to respond to his calls. Earlier, same evening at 1116 on 28.031 MHz he worked S21A. Bill is of the opinion that my information in the January issue is correct in that VK8RH was the first VK to work S21ZE.

Two — my advice that on 7/1/93 Ron VK4BRG had worked VK6JQ was incorrect as Bill's transceiver was out of action and awaiting spare parts at that time. It may have been a mistaken call sign. Thank you Bill for advising me of the needed corrections.

Incidentally, Bill VK6JQ uses a TS600 at 12 watts output to a six element long yagi at a height of 12 metres and all contacts are by CW. From 10 April 1985 until 24 February 1993 Bill had worked 45 countries from Broome, all but three since 1989. His contact with TL8MB on 3 April 1991 constitutes the VK6 and Australian long path record at 28397 km. Also, Bill says that Eric TL8MB is now XU5DX from Cambodia and as such has recently been giving a few VKs a new country.

John VK4PU says that March was noted for the almost daily appearance of JAs, a couple of visits from HL9 sometimes accompanied by much strong TV crud and much use of the call frequency by island stations. T20AA gives his manager as N4FJL. The early part of April brought in ZL, T30 and JA beacons.

John VK4TL at Malanda reports much the same results as VK4PU with Asian TV crud prominent amongst the JAs through March and April. On 13/3 at 0615 worked VR6JJ, 27/3 at 0330 T20AA; 27/5 JA2DJL, JA5AFE, JR3IIR, HL9UH and 29/5 JF1CZQ.

Ron VK4BRG sent me a copy of his Packet Bulletin of 11/4 wherein he said April propagation on many days included T20, T30, ZL, KH6 and JA. On 13/3 at 0605 and 14/3 at 0611 Ron worked VR6JJ and copied his beacon on 30/3 and 7/4, each time noting S1 signals from KH6. For what appears to be his only trans-Pacific contact for the equinox, on 19/3 at 2326

Ron had a weak CW QSO with N6XQ. If that was all that Ron could manage from his North Queensland location, is it any wonder everything has been quiet in southern climes.

Lloyd VK4FP from the Townsville area says April has been busy with KH6, T30, HL9, JA and BV2 available at good strength. VR6JJ heard twice but too weak to work. Lloyd says he felt frustrated not being able to work XU0 as good signals have prevailed from near areas such as BV2 and V85.

Brian VK4DDC added a brief comment in reply to a letter from me that to 13 April there had been no DX apart from JAs and mid-Pacific areas, so he was contemplating removing his six metre antenna until next cycle, concentrating his activity on the higher bands in the meantime. Removing the antenna seems a bit drastic to me but I suppose it depends upon what available space you have on the tower! Maybe 1296 to Brisbane where such activity is on the increase?

To change from the Queensland scene, **Adam VK3ALM ex VK3YWV** from Dandenong North says in his letter of 11/6 that the equinox was very quiet. On 10/4 at 0214 he worked Jack T30JH on Tarawa for a new country. Jack was only available for about eight minutes and there were no warning indicators of possible propagation.

On 14/5 at 0805 JA7ZMA/b was logged but no JAs. After twenty minutes the beacon disappeared and was replaced by JA2IGY/b and this propagation allowed a contact with JA2BZY at 0833. On 29/5 Adam worked Bob ZL3TY at 0756.

Adam also advised recent reading indicated that the next cycle maximum is expected in the year 2000, only three years after the minimum in 1997. The article also said that the shortest "11 year cycle" was 7.3 years (1829-1837) and the longest was 17.1 years (1788-1805) — his comment was that is a "long time between drinks!"

The April report from **Vince VK2VC** says T30JH was prominent during early April with signals to 5x9 between 0100 and 0300. KH6IAA and NI6E/KH6 not strong and nothing from W etc. Last JA worked was on 14/3. KC6 observed ragchewing with HL9UH!

Nev VK2QF hasn't yet given away Cycle 22 but believes anything important that arrives now will be a bonus. His activity includes 7/3: JA7,8,0; 14/3: BV2DQ, BV2DP; 22/3: JA1,7; 25/3: JA7; 6/4: NI6E/KH6; 7/4: T30JH, JH1WHS; 11/4: JA7,8. Also heard but not worked have been HL, DX1HB/b, ZL, FO3, KG6 and JR6.

Don VK6HK was fortunate to work XU0UN on 12/4 at 0735 when the two-way SSB signals were 3x1, using forward scatter. In advising me of this contact, Don also says that in total 50 countries have been worked from Perth and a further 11 have been listed as heard — the ones missed being BY, JD1, YS, C21, I, VK9 (Norfolk), 4S7, OK, ZC4, ZS9 and EI.

In response to a letter from me I have had a reply from Peter VK1RX who indicates he has worked 39 countries from Canberra, although this year has been quiet. JAs have been worked, also P29JA, HL9UH, FK8GA and there were several good openings to VK6 during January. Some of his time is spent working stations on two metres via aircraft enhancement.

Mongolia QSLs

It appears some amateurs are having trouble obtaining a QSL from JT1. **Tom VK4ZAL** had such trouble until he enlisted the help of the Central Radio Club of Mongolia and club station JT1JA. The following information may assist: Send your QSL to Tom, PO Box 470, Ulanbator-13, Mongolia, Asia — via Japan.

Tom is JT1BY (listed in call book), and he says to send your cards via Japan, not Russia as it appears letters have been lost via Russia during the past two years and also they are having problems with QSLs from Europe. IRCs are not accepted in Mongolia and return postage requires $US1, or $US2 for an "R" letter which I presume means a registered letter, so good luck! If there had been space I would like to have printed the letter from JT1BY as the Mongolian English is interesting!

Two metres

From Brisbane Rod **VK4KZR** writes that *the usual aircraft-scatter contacts between the Brisbane gang and* ***Gordon VK2ZAB*** *in Sydney continue on a regular basis. Gordon's signal has improved since his antenna modifications. Typically the "opening" is about fifteen minutes with signals peaking to 5x5.*

Doug VK4OE has operated from various spots in western Queensland. He made several contacts to Brisbane from St. George and Roma and almost made it to **VK2ZAB** from St. George.

From 2 May Rod commenced a series of meteor scatter tests with Mike **VK2FLR** in Sydney and **Arie VK3AMK** in Werribee, making use of the Eta Aquarids meteor shower. Arie was worked on the first attempt but the more difficult path to Mike required several attempts until a completed contact was made on 4/5 with several ten second bursts observed. Rod is interested in M/S schedules with other stations and awaits your move!

Meteor Showers

Following on from the above, **Emil Pocock W3EP** in the July 1993 issue of QST's *The World Above 50 MHz*, devotes a whole page headed Meteor and Propagation Monitors which includes much valuable information on frequencies to monitor and the use of strip-chart recorders and/or personal computers to provide an automatic way of keeping track of meteor activity.

Emil also devotes three pages to a separate article in the same issue headed *The Perseids Meteor Shower in 1993*, wherein he writes *great surges of meteors punctuated the 1991 and 1992 Perseids shower. These unusual bursts and the recent reappearance of comet Swift-Tuttle suggest that the Perseids will put on an even more spectacular show this August 11-12, perhaps resulting in a rare meteor storm.* Included in the article is a large section devoted to operating procedures.

Emil adds that *based upon the general trends of the two previous years, great meteor bursts could be expected anytime between 1800 Z on August 11 and 0600 Z on August 12. This period includes all four 1991 and 1992 surges, adjusted for 1993 dates and times.*

This issue of AR should be out in time for you to rush and buy a copy of July QST and set up your station to participate in what could be an interesting event. Limit your calls and listening to about 10-15 seconds and try and complete the contact with a particular station — it may take several bursts — rather than chasing others willy-nilly! Call "CQ scatter" and listen in the general direction from which you hope contacts may eventuate. 50, 144 and 432 MHz could be used with SSB considered the best mode of operation.

1296 MHz

Interest has been generated by the appearance of **Rob VK2BBR** on this band. From his station at Lismore Rob has had regular SSB contacts to the Brisbane area with **VK4DH, VK4OE** and **VK4KZR**. They look expectantly to the north hoping someone further along the coast will exhibit an interest in 1296 MHz.

News from Europe

With his information **Ted Collins G4UPS** sent a note stating that March was their worst month since 1987 for six metres! Many of his contacts for March were via auroral conditions. ZS6 and 7Q7 using TEP to contact Mediterranean countries and LX1SI. SV worked to LU, CX and PY.

Ted says that UK novices now have access to the full allocation of 50.000 to 52.000 MHz from February 1993 instead of from 51.000 MHz.

From time to time Ted supplies quite a lot of information about activation of countries on six metres and I find it difficult to decide whether to include the news because we are so far from the activity. It would be easy to say that there will be no F2 to help VK contact such areas, but then, how sure can we be when taking into account the way six metres can respond, even for short periods. But here goes!

A six metre rig has been shipped to 5R8DG in Madagascar. Murtada 9K2MU is a new station from Kuwait. Steve ZD8LII is active from Ascension Island. ET3DX from Ethiopia was active during April but for how long? Mike CN8CC is active from Morocco. Alex 4X1MH worked his first European contacts on 16/5/93. EA8SIX is a new beacon on 50.075 MHz.

The northern hemisphere summer Es period was well under way in May with contacts to stations using the following prefixes: 4X1, 5B4, 7Q7, 9A2, 9H1, C31, CN8, CT, DL, EH1, EH9, ES5, EV9, F, FC1, I, IS0, LA, OD, OE, OH, OK, OY, OZ, SM, SP, SV, UB5, UC2, YU, ZB0 — that's 31 countries involved, often with many contacts to each area! Surely Europe is the place where you could turn on a VHF rig at any time of the day and there would always be one or more stations to work. I suppose that when the Es peaks there in June, all 50 countries in Europe will have been worked as it seems no country would be further than a double-hop for Es. Fantastic!

Geoff GJ4ICD from Jersey Island reports the summer Es started well with 9 May commencing at 0800 with EH9IB and by 0900 the band was full of activity, with several CN8 stations in Morocco coming right across Europe. At 1028 CT3FT from Madeira rose to 5x9 but the best was to come with reception at 1100 for ten minutes of the FY7 beacon from French Guiana, South America. He queries whether it was ES extended TEP or multi-hop Es. (The distance is about 6000 km or four hops which would be rare for Es....VK5LP). Stations from the Caribbean were audible on 28 MHz at the time.

On 12/5 the MUF climbed sufficiently for 144 MHz to open for contacts between the UK, France and Switzerland to Greece, also CN8ST to HB9QQ. This high MUF provided a set of incredible conditions on six metres so that ES enhanced TEP provided 7Q7JL from Malawi and ZS6s were heard. The good conditions were shared over much of Europe and the band was still alive at 1900.

On 13/5 **Ted G4UPS** worked UC2AA (Belarus — ex Belarussia) for the first ever contact with the UK. Later CT3FT from Madeira Island at S9+ was into **GJ4ICD** for three hours, followed by ZD8VHF/b from Ascension Island and V51VHF/b from Namibia both S9+ via ES plus TEP. The following day JX3DA on Jan Mayen Island heard G3SYC in York. All these operations are over considerable distances and probably for the first time many UK and European operators will experience the pleasures which come from now being able to respond to the TEP mode.

Geoff said that on 19/5 he managed a one minute contact with Fred C31HK from Andorra, who later advised that his May contacts were the first legal operations on 50 MHz from that country, where there are six operators. Other snippets of information from Geoff are:
3V from Tunisia will be on 50 MHz during August at least. SV5 (Dodecanese Is) and 3V9 (Crete) now have six metre permits. The French calling frequency is 50.210 MHz. EH8ACW operates from Canary Island. Hal ZS6WB has recently shipped 50 MHz equipment to C91J in Mozambique and 5R8DG in Madagascar. Geoff said my list of 150 countries worked by UK amateurs (May AR) left out 4S, 8Q, YC, FR/6 and HA so that makes a total of 155 countries! UK 10 GHz information requested has arrived and will be included at a later date.

First worked from Australia

Despite my hospitalisation, this segment has continued to proceed. Before turning off the lights I posted 35 letters to various participants in the listing, asking for details to be checked and some additional information. Most have replied but some remain outstanding and it would assist the final result if I had your replies please.

Closure

Its been a difficult three months for me, but I have "survived" and somehow managed to get these notes together. Perhaps by next month all will be flowing smoothly. Closing with two thoughts for the month: 1. Everybody wants sympathy, but nobody wants people feeling sorry for them, and 2. Too many people confuse bad management with destiny.

73 from The Voice by the Lake.

PO Box 169 Meningie SA 5264.

ar

Spotlight on SWLing

*Robin L. Harwood VK7RH**

As I was recently browsing in a local newsagency, I came across a booklet entitled "The Dawn Of Australia's Radio Broadcasting" by Philip Geeves and published by Electronics Australia. Naturally, as I have always been fascinated by the early days of radio, I eagerly picked up this 74 page book. It is in a magazine format, and is extremely informative about the early days of radio broadcasting in Australia. The author, Philip Geeves, completed Part 1 of a projected history of Australian Broadcasting, shortly before his death in 1983 and Jim Rowe of "EA" has managed to compile and publish this unfinished manuscript. It is very readable and hopefully others will take on this task and complete the remaining parts of the history of Australia's broadcasting.

This booklet covers the period from the commencement of broadcasting in 1920 to the creation of the Australian Broadcasting Commission on the 1st of July 1932. History records that the first regular radio broadcast commenced on the 2nd of November 1920 in East Pittsburgh, PA at the Westinghouse plant. It was only 50 watts and its call has gone down in history.... KDKA. The first broadcast from KDKA were returns of the US presidential election.

Although the book doesn't mention it there indeed were other radio broadcasts prior to KDKA's commencement, but these were *mainly* experimental transmissions. For example, I do recollect reading in a school primer the account of the first broadcast of speech over wireless was back in 1906 in Boston MA. The article described the dramatic effect on the "Sparks", when they heard speech coming over the ether. I think it must have been around Christmas as well.

The first public demonstration of radiotelephony in Australia was held at

Victoria's Parliament House. (This building also doubled as the Federal Parliament House, prior to Canberra.) It was in Melbourne on Wednesday 13th of October 1920 at the request of the then Prime Minister, Billy Hughes.

It was worth noting that amateurs played a significant role in the development of broadcasting in Australia. In fact they pioneered the field until the regular commencement of broadcasting stations. The first regular broadcasting station, 2SB, came out of W J Maclardy's experimental station 2HP in Cremorne. Maclardy, besides being a licensed amateur, was also the publisher of "Wireless Weekly".

2SB started out with only 10 watts from the Smith's Weekly offices in Phillip Street. It wasn't too long before a 500 watt transmitter was used. 2SB commenced regular broadcasts on Thursday November 13th 1923 on a frequency of 857 Kilocycles (350 metres). The callsign was altered early in 1924 to 2BL, which is still operational, now on 702 kHz. I hope that this broadcasting milestone won't go unnoticed in November of this year. 70 years is certainly worth celebrating.

A large Sydney retailer, Farmer and Company, contracted AWA to install their station, 2FC, which commenced just a few weeks later on the fifth of December 1923 on 1100 metres (273 Kilocycles).

I was surprised to learn that both 2FC in Sydney and 3LO in Melbourne operated on the longwave band, when they first started. 3LO started on 1720 metres but changed to 808 kilocycles early in 1925. Only the Europeans are today still employing longwave frequencies for broadcasting.

I found this booklet informative yet it neglected the importance of Father Shaw's contribution to the development of radio in Australia. There needs to be a book written about him alone and how he organised a network of coastal stations around Australia. I believe that the ABC had a program on Father Shaw's contribution to the history of radio in Australia. Likewise other radio pioneers aren't mentioned. This booklet is a history of broadcasting and not a general overview of the development of radio. Nevertheless, it is still worth reading and is reasonably priced.

Many international broadcasters have been mentioning that they are now on satellite transponders as well as being on shortwave. The BBC, Deutsche Welle, Swiss Radio International and other mainly European organisations have been available for 12 months via satellite. The main purpose of these services is to feed cable or other rebroadcasting stations. Recently, SRI in Berne caused an outcry by dropping services within Europe on shortwave. They made a false assumption that there are many Europeans with facilities for receiving programs directly from satellite. These broadcasts are usually on a subcarrier of an existing TV transponder.

As it is at present, there are many satellite receivers on television, but few have the facilities to receive these subcarrier signals on radio. SRI estimated that there were 2 million who could receive them but were wide of the mark. The economic cost of these sets is quite high compared to the cost of a shortwave radio. Also, there are some nations where it is illegal to own or use satellite receivers.

The VOA in Washington has stated that direct satellite broadcasting is not likely to generate mass audiences, unless an existing broadcaster relays on cable or terrestrially rebroadcasts the output. As the main audiences on shortwave are in the developing world, where the economic cost of a suitable receiving system will be beyond the reach of all but the wealthy and powerful, shortwave radios are still a powerful force to convey information across international borders.

Well, that is all for this month. Until next time, good listening!

* 52 Connaught Crescent, West Launceston. TAS 7250 or VK7RH@VK7BBS

ar

Pounding Brass

Due to circumstances beyond our control, we regret that we are unable to publish the "Pounding Brass" column this month.

UPDATE

HFC Regulated Variable Voltage Power Supply

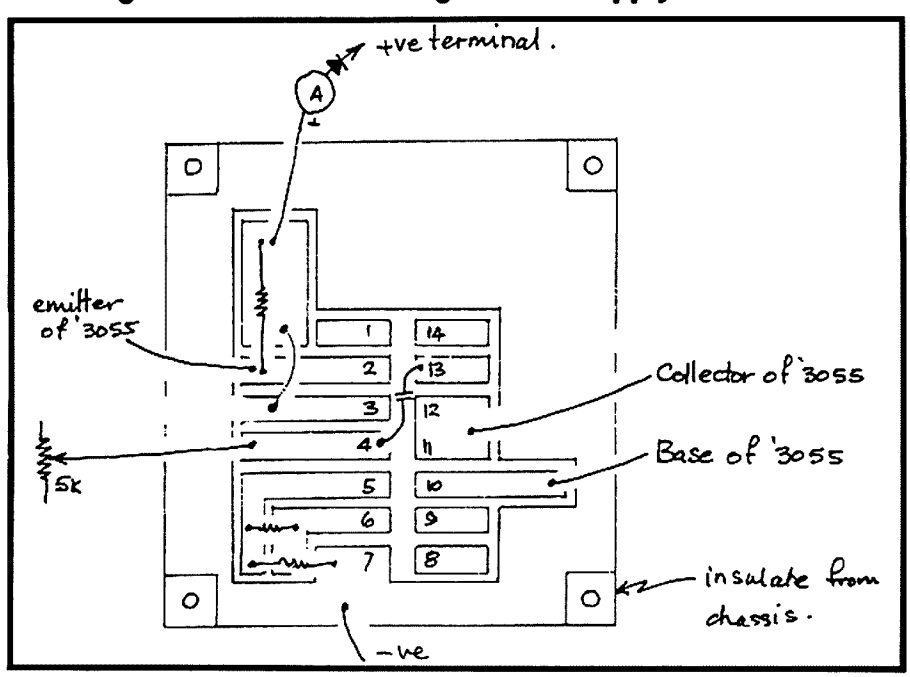


Figure 2 — LM273 Component Location.

Drew Diamond VK3XU has pointed out an error in the "Fig 2 — LM723 Component Locations" diagram on page 21 of the May 1993 issue of *Amateur Radio magazine.* Drew points out that, although the circuit is correct, if the board is wired as shown on the published printed circuit board diagram, the voltage can only be adjusted down to 8 V rather than to 4 V as specified. Note from the new circuit board diagram that the two 1.5 K ohm resistors join together at pin five of the LM723 and not at pin 6 as shown on the board layout in May.

Make sure you alter the board layout on page 21 of your May 1993 copy of *Amateur Radio* magazine now!

ar

WICEN

News from WICEN (NSW) Inc.

The Annual General Meeting of WICEN (NSW) Inc. was held at Amateur Radio House, Parramatta, on Saturday 10th July, with about twenty five people in attendance. This was a disappointing turnout, given that there are several hundred WICEN members in NSW.

Following the formal reports, the result of the nominations for the various positions was announced. As there were sufficient nominations to fill the vacancies, an election was not necessary. The office bearers for 1993-1994 are:

President:	Bill Allen VK2APN
Vice-Presidents:	Brett Wilkinson VK2XMU
	John Buxton VK2GJB
Secretary:	Peter Corkeron VK2AGB
Treasurer:	Annette Wilkinson
Committee:	Simon Clowes VK2CSC
	Neale Imrie VK2CNI
	Alan Whitmore VK2YYJ
	Dave Horsfall VK2KFU
	Brad McMaster VK2KQH

Note that the State Co-ordinator is not elected at the AGM, but is appointed separately; earlier this year John Howard VK2AMH replaced Phil Greentree VK2IW who had resigned.

There was some discussion in General Business such as the difficulty of obtaining a consistent colour on overalls, and whether a different colour ought to be specified; the importance of completing time sheets per VRA requirements and the Assets Register per Charity requirements; and details of the forthcoming events. The meeting finished with a presentation from Brett VK2XMU and Eric VK2KUR on the WICEN (NSW) telephone BBS, accessible on (02) 888 2763 (currently with access on 300/1200/2400 bps, soon to go to 9600/14400 bps). Members are urged to use this BBS, as the more people using it the better it will be.

WICEN (NSW) members are reminded that the last day for renewal is 30th September; after that you will be considered unfinancial.

Two important exercises in August are the Annual City to Surf Fun Run on Sunday 8th August, with Brett VK2XMU in charge; and on the weekend of 14th-15th August is the Batemans Bay Car Rally, organised by Dave VK2BDJ.

Forthcoming WICEN (NSW) events appear on the VK2 BBS; along with general WICEN news they also appear on the national packet radio network, usually addressed as "WICEN @ VKNET"; they can be downloaded from the VK2RWI packet BBS (and probably others) in the "WICEN" files area; members with access to USENET can read them in newsgroups "aus.radio.wicen" and "rec.radio.info"; those with Internet access can obtain them via anonymous FTP from "grivel.une.edu.au" under "pub/ham-radio/aus.radio/WICEN"; and FidoNet users can read them on the "WICEN_General" conference. For the benefit of readers confused by these esoteric terms, an article explaining them is in preparation for a future issue.

The address of WICEN (NSW) Inc. is PO Box 123, St Leonards 2065. WICEN (NSW) conducts nets at various times; the only one we know about is the Sydney VHF Net every Thursday night at 2130 local time on repeater 7150 in Chatswood.

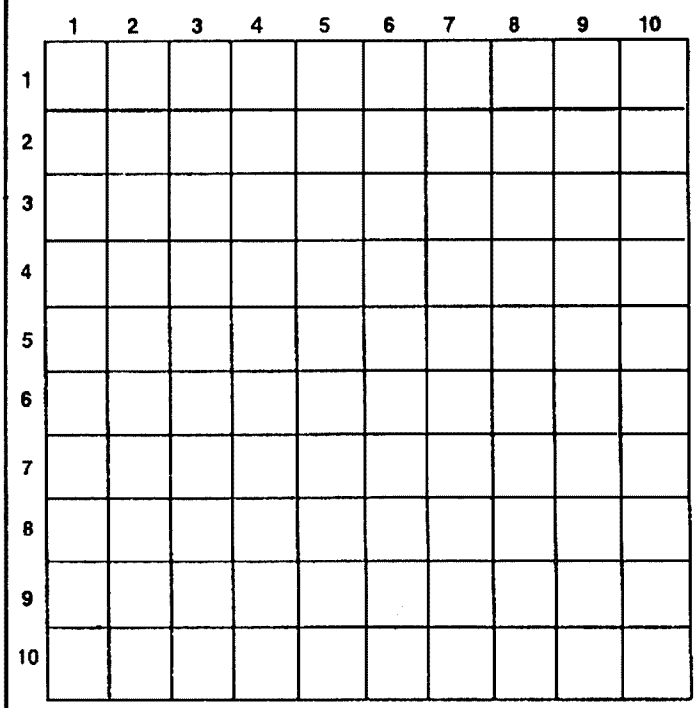
Dave Horsfall VK2KFU, Publicity Officer, WICEN (NSW) Inc.

ar

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

Morseword 77

Solution Page 56



© Audrey Ryan 1992

Across:

1 Irish Pound
2 Public transport
3 Capital of Peru
4 Passenger
5 Sense
6 Squander
7 Annoy
8 Attempted
9 Mothers
10 Little Vivienne

Down

1 Cheek
2 Baby Tom
3 Entitled
4 Sharp Whisper
5 Group of rooms
6 Young Stephen
7 Bakery
8 Christmas
9 Chooks
10 Half a dance?

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used for these calculations is 60.3, while the predicted value for September is 57.2 and for October it is 55.2. ar

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.8	7	7.7	2	-15	-33	...	...
2	8.6	-2	6.6	-1	-17	-36	...	...
3	8.8	-8	6.8	-1	-15	-31	...	...
4	11.9	-2	9.3	1	-3	-13	-28	...
5	16.9	4	13.1	0	3	0	-8	-19
6	19.6	4	14.9	0	5	3	-3	-12
7	18.9	4	14.2	0	4	2	-4	-14
8	17.3	4	12.9	2	4	0	-8	-20
9	15.3	5	11.5	4	3	-3	-15	-29
10	13.3	4	10.0	5	0	-9	-25	...
11	11.7	5	8.7	5	-5	-18	-37	...
12	10.5	7	7.7	4	-10	-27	...	...
13	9.7	13	7.2	3	-16	-36	...	...
14	9.3	19	6.8	2	-21	...	...	...
15	9.1	25	6.7	2	-25	...	...	...
16	9.0	27	6.7	1	-27	...	...	...
17	8.9	30	6.7	1	-28	...	...	...
18	8.5	31	6.4	-2	-34	...	...	...
19	8.0	31	6.1	-8	...	...	...	...
20	8.5	31	6.5	-2	-34	...	...	...
21	8.5	31	6.5	-3	-35	...	...	...
22	8.1	28	6.3	-6	-39	...	...	...
23	7.8	17	6.1	-8	-38	...	...	...
24	8.2	11	6.5	-4	-30	...	...	...

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.4	10	9.1	10	5	-3	-16	-32
2	12.8	12	8.7	12	4	-6	-21	-39
3	12.1	15	8.3	12	2	-9	-27	...
4	11.6	17	8.0	13	0	-13	-33	...
5	11.5	24	7.9	16	0	-15	-37	...
6	12.3	24	8.6	19	4	-9	-29	...
7	14.5	22	10.1	23	13	2	-14	-31
8	13.8	18	10.5	17	7	-3	-20	-38
9	11.2	10	8.6	9	-1	-13	-31	...
10	10.8	1	8.1	4	-4	-15	-32	...
11	10.2	-7	7.5	1	-5	-15	-32	...
12	9.7	-14	7.1	0	-5	-14	-29	...
13	9.5	-24	7.1	-4	-7	-15	-29	...
14	9.4	...	6.9	-12	-14	-22	-37	...
15	9.3	...	6.9	-19	-19	-28	...	...
16	8.8	...	6.7	-25	-27	-36	...	...
17	8.3	...	6.3	-33	-35	...	...	...
18	8.8	...	6.7	-27	-28	-37	...	...
19	10.8	-20	7.9	-5	-4	-9	-19	-33
20	14.2	-6	10.9	-6	-1	-3	-11	-21
21	17.4	1	12.1	-4	2	1	-4	-13
22	16.2	4	11.1	1	4	2	-5	-14
23	15.1	6	10.3	5	5	1	-8	-20
24	14.3	8	9.7	8	6	-1	-12	-26

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.8	2	9.7	4	1	-7	-20	-37
2	13.2	-3	9.9	0	0	-5	-17	-31
3	16.6	0	12.4	-5	1	0	-5	-14
4	21.2	4	16.0	-12	1	4	2	-3
5	23.4	3	17.7	-15	0	3	3	-1
6	23.1	3	17.5	-15	0	3	2	-1
7	22.2	3	16.8	-13	0	3	1	-3
8	20.6	3	15.6	-8	2	3	0	-6
9	18.7	4	14.1	-3	4	3	-2	-11
10	16.9	5	12.8	2	5	1	-7	-18
11	15.2	6	11.5	6	4	-2	-13	-28
12	13.9	9	10.5	9	3	-6	-21	-39
13	13.1	14	9.9	12	2	-10	-28	...
14	12.4	19	9.3	14	0	-15	-37	...
15	11.8	24	8.9	15	-3	-21	...	...
16	11.3	26	8.5	14	-6	-26	...	...
17	11.1	28	8.4	14	-8	-29	...	...
18	10.2	29	7.8	9	-16	...	...	...
19	9.0	30	6.9	1	-29	...	...	...
20	9.3	30	7.2	3	-25	...	...	...
21	12.2	28	9.1	19	0	-19	...	...
22	13.6	25	10.4	23	9	-4	-23	...
23	12.4	17	9.5	14	2	-10	-30	...
24	14.4	12	11.0	12	7	-1	-14	-30

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.5	11	17.9	11	15	14	9	1
2	23.7	11	18.5	9	15	14	9	2
3	23.7	11	18.1	9	15	13	9	2
4	23.9	11	18.2	10	15	14	9	2
5	23.9	11	18.3	12	16	15	10	2
6	23.3	12	17.8	15	18	15	9	1
7	22.0	13	16.9	19	19	15	7	-2
8	20.5	16	15.6	26	21	14	4	-8
9	19.0	20	14.6	32	23	13	-1	-16
10	17.5	21	13.4	32	19	7	-9	-27
11	16.3	23	12.4	30	16	2	-17	-38
12	15.6	23	11.8	29	12	-2	-23	...
13	14.6	24	11.1	26	8	-9	-32	...
14	13.6	25	10.4	22	1	-17	...	...
15	12.7	25	9.7	18	-4	-26	...	...
16	12.2	26	9.3	15	-9	-32	...	...
17	10.9	26	8.4	7	-22	...	...	...
18	9.2	28	7.1	-9	...	...	...	...
19	9.3	28	7.2	-8	...	...	...	...
20	11.7	27	8.9	14	-11	-35	...	...
21	15.6	21	12.2	26	12	0	-19	...
22	21.9	15	16.9	23	21	16	7	-2
23	23.4	13	18.0	18	19	17	10	2
24	23.5	12	18.0	13	17	15	9	1

VK EAST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.6	24	18.5	33	32	29	23	15
2	24.5	24	18.4	33	33	29	23	15
3	24.4	24	18.4	34	33	30	23	15
4	24.0	25	18.1	36	34	30	23	14
5	23.0	26	17.4	39	35	30	22	12
6	21.4	29	16.2	43	37	30	19	8
7	19.4	32	14.7	44	35	26	14	1
8	17.5	33	13.2	42	31	21	7	-8
9	15.6	35	11.8	40	27	14	-2	-19
10	14.3	37	10.7	37	22	8	-9	-29
11	13.4	38	10.1	35	19	3	-15	-37
12	12.6	39	9.4	33	14	-1	-22	...
13	11.9	40	8.8	30	10	-6	-29	...
14	11.4	40	8.5	28	8	-10	-34	...
15	11.1	41	8.4	27	6	-12	-37	...
16	10.2	42	7.8	22	0	-21	...	...
17	9.0	43	6.9	15	-11	-35	...	...
18	9.3	43	7.2	17	-8	-31	...	...
19	12.3	38	9.6	31	13	-3	-25	...
20	17.1	30	13.2	37	28	18	4	-10
21	21.1	27	16.2	36	32	26	17	6
22	23.2	25	17.7	35	33	29	21	12
23	23.9	24	18.2	34	32	29	22	14
24	24.3	24	18.4	33	32	29	23	14

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.7	6	17.9	-6	5	7	5	0
2	23.1	8	17.8	1	9	10	6	1
3	20.8	12	16.7	9	13	11	6	-2
4	19.0	15	15.2	18	16	11	3	-7
5	18.0	19	14.3	25	19	12	0	-12
6	17.2	23	13.6	30	21	11	-2	-17
7	16.4	25	13.3	31	20	9	-5	-22
8	15.6	26	12.2	30	18	6	-10	-28
9	14.7	28	11.4	29	15	2	-16	-36
10	13.6	28	10.4	26	11	-4	-24	...
11	12.7	29	9.7	23	6	-10	-32	...
12	12.8	27	9.6	21	3	-14	-38	...
13	12.0	26	9.0	18	-2	-20	...	...
14	11.5	21	8.6	12	-5	-24	...	...
15	11.1	14	8.4	8	-7	-24	...	...
16	10.1	3	7.7	2	-11	-28	...	...
17	8.8	-9	6.8	-2	-16	-32	...	...
18	9.0	-15	7.0	-2	-12	-26	...	...
19	12.1	-7	9.4	-2	-4	-11	-25	...
20	16.9	0	13.0	-6	0	-1	-8	-17
21	20.7	2	15.9	-11	0	2	0	-6
22	22.6	3	17.3	-14	0	3	1	-3
23	23.1	3	17.6	-14	0	3	2	-2
24	23.4	4	17.8	-11	2	4	3	-1

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.1	15	6.9	1	-20	...	...	...
2	9.3	9	7.2	1	-17	-37	...	...
3	12.5	10	9.3	9	0	-13	-31	...
4	17.5	10	13.5	11	10	4	-6	-18
5	19.8	8	16.1	7	9	6	-1	-11
6	20.8	7	16.8	4	9	7	0	-8
7	20.4	6	16.3	4	8	6	0	-10
8	19.3	7	15.3	5	8	4	-3	-13
9	17.7	7	14.0	7	7	2	-7	-20
10	15.8	8	12.4	8	5	-2	-15	-30
11	13.7	8	10.7	8	1	-9	-26	...
12	11.9	10	9.3	7	-5	-19	...	...
13	10.7	14	8.2	6	-12	-30	...	...
14	9.8	20	7.5	3	-20	...	...	...
15	9.4	25	7.2	2	-25	...	...	...
16	9.1	27	6.9	0	-29	...	...	...
17	8.9	29	6.8	-1	-32	...	...	...
18	8.7	30	6.7	-2	-35	...	...	...
19	8.4	30	6.5	-5	-39	...	...	...
20	8.2	30	6.4	-7	...	...	...	...
21	8.8	30	6.9	-2	-34	...	...	...
22	8.6	30	6.7	-2	-35	...	...	...
23	8.3	28	6.5	-5	-38	...	...	...
24	8.8	21	6.9	-1	-28	...	...	...

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.5	8	14.9	7	9	6	-1	-12
2	19.9	8	15.1	5	9	6	-1	-10
3	20.1	8	15.1	5	9	6	0	-10
4	20.0	8	15.1	5	9	6	0	-10
5	19.9	8	15.0	7	10	7	0	-10
6	19.4	9	14.7	9	10	6	-2	-13
7	18.5	10	14.0	12	11	5	-5	-18
8	16.9	13	12.8	17	11	1	-12	-29
9	15.1	19	11.4	21	7	-7	-27	...
10	13.3	21	10.0	17	-2	-22	...	...
11	11.7	22	8.8	9	-16	...	...	...
12	10.6	24	7.9	1	-30	...	...	...
13	9.9	25	7.4	-4	...	...	...	...
14	9.4	25	7.0	-10	...	...	...	...
15	9.2	25	6.8	-13	...	...	...	...
16	9.1	25	6.8	-14	...	...	...	...
17	9.0	25	6.8	-15	...	...	...	...
18	8.5	26	6.5	-23	...	...	...	...
19	7.8	26	6.0	-35	...	...	...	...
20	8.1	26	6.3	-28	...	...	...	...
21	10.3	25	8.0	0	-34	...	...	...
22	13.8	11	10.7	11	-1	-15	-35	...
23	16.9	9	13.0	11	7	0	-12	-28
24	18.7	9	14.3	9	10	5	-4	-16

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.6	6	8.8	7	1	-7	-21	-39
2	12.0	9	8.4	9	0	-11	-28	...
3	11.4	13	8.0	10	-2	-15	-35	...
4	11.0	17	7.7	10	-4	-20	...	...
5	10.9	23	7.7	13	-5	-22	...	...
6	11.8	23	8.4	16	0	-15	-38	...
7	13.6	21	9.7	20	8	-4	-21	...
8	13.6	17	10.6	16	5	-7	-25	...
9	11.8	12	9.2	9	-3	-16	-36	...
10	10.6	4	8.2	4	-7	-21	...	...
11	9.7	-3	7.5	1	-9	-22	...	...
12	9.3	-11	7.1	0	-8	-20	-39	...
13	9.1	-21	7.1	-3	-10	-20	-38	...
14	8.9	...	6.8	-15	-20	-31	...	...
15	8.8	...	6.8	-25	-29	...	...	...
16	8.4	...	6.5	-36	...	...	...	...
17	8.1	...	6.3	...	...	...	...	...
18	8.6	...	6.8	...	...	...	...	...
19	10.2	...	7.7	-23	-20	-27	...	...
20	12.9	-12	10.3	-7	-2	-5	-12	-23
21	15.7	-5	11.8	-9	-1	-2	-8	-16
22	15.4	-3	10.8	-7	0	-1	-7	-16
23	14.3	-1	10.0	-2	1	-2	-10	-22
24	13.4	2	9.3	3	2	-4	-15	-29

VK SOUTH SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.0	13	13.6	19	13	4	-9	-25
2	18.3	13	13.7	19	14	5	-8	-23
3	18.2	14	13.7	20	14	6	-6	-24
4	18.1	15	13.6	22	15	6	-8	-25
5	17.5	17	13.3	25	15	5	-11	-29
6	15.9	21	12.0	27	13	-1	-21	...
7	14.4	24	10.9	25	7	-10	-34	...
8	12.8	26	9.6	19	-3	-24	...	...
9	11.3	28	8.5	12	-15	...	...	...
10	10.2	30	7.6	5	-26	...	...	...
11	9.3	31	6.9	-3	...	...	...	...
12	8.7	32	6.5	-9	...	...	...	...
13	8.3	33	6.1	-14	...	...	...	...
14	8.1	33	6.0	-16	...	...	...	...
15	8.1	33	6.0	-17	...	...	...	...
16	7.4	34	5.7	-25	...	...	...	...
17	7.3	34	5.6	-27	...	...	...	...
18	7.1	34	5.5	-31	...	...	...	...
19	7.5	30	5.8	-24	...	...	...	...
20	9.2	21	7.2	-4	-36	...	...	...
21	12.1	17	9.3	10	-8	-28	...	...
22	14.7	15	11.3	16	4	-9	-29	...
23	16.6	14	12.6	18	10	0	-16	-35
24	17.5	13	13.3	18	12	3	-11	-28

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.8	9	9.7	9	2	-8	-24	...
2	13.1	1	9.9	3	0	-7	-20	-36
3	16.7	3	13.1	-1	3	1	-6	-15
4	21.5	5	16.4	-8	3	5	3	-2
5	22.4	3	16.8	-12	1	4	2	-2
6	22.3	3	16.7	-13	0	3	1	-3
7	21.7	3	16.3	-13	0	3	1	-4
8	20.6	2	15.4	-10	1	2	0	-6
9	18.7	2	14.1	-5	2	2	-3	-11
10	16.6	3	12.5	0	3	0	-8	-20
11	14.4	3	10.8	3	1	-5	-17	-32
12	12.6	6	9.4	6	-2	-13	-30	...
13	11.3	10	8.4	6	-7	-23	...	...
14	10.5	15	7.8	6	-13	-32	...	...
15	10.0	23	7.4	5	-19	...	...	...
16	9.8	26	7.2	4	-22	...	...	...
17	9.7	28	7.2	4	-23	...	...	...
18	9.7	29	7.3	4	-24	...	...	...
19	9.2	29	7.0	0	-30	...	...	...
20	8.7	29	6.6	-4	-37	...	...	...
21	9.2	29	7.1	0	-30	...	...	...
22	11.3	27	8.8	14	-8	-30	...	...
23	11.2	24	8.6	13	-6	-25	...	...
24	14.7	18	11.3	19	11	0	-14	-32

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.0	6	17.8	-5	5	7	5	0
2	22.9	9	17.1	4	11	10	7	0
3	22.2	13	17.0	13	16	14	8	1
4	20.2	17	16.1	21	20	15	7	-2
5	19.1	20	15.2	28	23	16	5	-8
6	18.4	23	14.3	32	24	15	3	-11
7	17.0	23	12.7	31	19	8	-7	-24
8	14.7	25	11.0	27	12	-2	-21	...
9	12.9	27	9.6	21	3	-14	-38	...
10	11.5	28	8.5	16	-5	-26	...	...
11	10.8	29	7.9	12	-12	-34	...	...
12	10.2	29	7.5	9	-16	...	...	...
13	10.0	26	7.5	7	-18	...	...	...
14	9.9	20	7.4	5	-17	-39	...	...
15	9.9	12	7.4	3	-15	-34	...	...
16	9.4	1	7.1	0	-15	-32	...	...
17	8.8	-9	6.7	-2	-15	-31	...	...
18	9.2	-13	7.1	-1	-10	-23	...	...
19	11.5	-9	8.4	-2	-4	-12	-26	...
20	15.3	-2	11.7	-5	0	-3	-11	-22
21	18.7	1	14.3	-9	0	1	-3	-11
22	21.0	2	16.0	-12	0	2	0	-5
23	22.2	3	16.8	-12	0	3	2	-3
24	22.7	4	17.1	-10	2	5	3	-1

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.7	21	6.7	-1	-29	...	...	...
2	8.9	13	6.9	0	-22	...	...	...
3	12.2	12	9.1	9	-2	-18	-36	...
4	17.3	11	13.4	12	9	3	-8	-21
5	20.1	8	15.3	8	10	7	-1	-11
6	20.8	7	15.6	5	9	6	0	-9
7	20.7	6	15.5	4	8	6	0	-10
8	20.2	6	15.1	4	6	5	-2	-11
9	19.1	6	14.3	5	7	4	-4	-15
10	17.4	8	13.1	8	7	1	-9	-22
11	15.4	9	11.6	10	5	-3	-17	-34
12	13.4	11	10.0	10	0	-11	-30	...
13	11.7	15	8.7	9	-6	-22	...	...
14	10.5	20	7.8	7	-14	-35	...	...
15	9.8	25	7.2	5	-21	...	...	...
16	9.3	28	6.9	2	-26	...	...	...
17	9.1	30	6.8	1	-29	...	...	...
18	9.0	31	6.7	1	-30	...	...	...
19	9.0	31	6.7	0	-31	...	...	...
20	8.6	32	6.5	-3	-36	...	...	...
21	8.1	32	6.2	-7	...	...	...	...
22	8.6	32	6.6	-3	-36	...	...	...
23	9.0	31	6.8	1	-30	...	...	...
24	8.3	30	6.4	-4	-38	...	...	...

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.5	12	17.3	14	17	14	8	-1
2	22.9	11	17.5	12	15	14	8	0
3	23.1	11	17.5	10	15	13	8	0
4	23.3	11	18.1	10	15	13	8	1
5	23.3	11	17.6	10	15	14	8	1
6	23.3	12	17.7	12	16	14	9	1
7	23.1	12	17.6	15	18	15	9	1
8	22.3	13	17.0	19	19	15	8	-1
9	20.9	15	15.9	24	21	15	5	-6
10	19.2	19	14.5	30	22	12	-1	-16
11	17.5	20	13.4	29	18	8	-10	-28
12	15.9	21	12.1	27	12	-2	-22	...
13	14.7	22	11.2	24	6	-10	-34	...
14	13.9	23	10.5	22	2	-17	...	...
15	13.1	24	9.9	18	-4	-25	...	...
16	12.3	24	9.4	14	-11	-35	...	...
17	11.7	24	8.9	10	-18	...	...	...
18	11.3	25	8.6	7	-22	...	...	...
19	10.3	25	7.9	-1	-36	...	...	...
20	8.9	26	6.9	-18	...	...	...	...
21	9.1	26	7.1	-15	...	...	...	...
22	12.2	20	9.2	11	-11	-34	...	...
23	17.1	14	13.2	18	11	2	-12	-29
24	20.8	13	16.1	17	17	12	3	-7

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.2	-4	8.6	-1	-3	-9	-22	-37
2	11.6	-1	8.2	1	-4	-13	-27	...
3	11.0	1	7.8	3	-5	-16	-34	...
4	10.6	4	7.6	3	-7	-20	-39	...
5	10.6	8	7.6	5	-7	-21	...	...
6	11.4	11	8.2	8	-4	-17	-36	...
7	13.1	13	9.5	12	3	-8	-24	...
8	15.2	14	11.0	15	9	0	-12	-27
9	15.4	11	12.2	13	6	-2	-15	-31
10	13.4	7	10.4	7	0	-9	-24	...
11	11.7	0	9.0	2	-5	-15	-31	...
12	10.4	-8	8.0	-1	-8	-18	-34	...
13	9.6	-16	7.3	-3	-8	-18	-33	...
14	9.2	-33	7.0	-11	-15	-25	...	...
15	8.9	...	7.0	-23	-26	-36	...	...
16	8.8	...	6.7	-32	-34	...	...	...
17	8.7	...	6.6	...	...	...	...	...
18	8.3	...	8.4	...	...	...	...	...
19	8.0	...	6.2	...	...	...	...	...
20	8.4	...	6.6	...	...	...	...	...
21	10.1	...	7.6	-21	-20	-26	...	...
22	12.8	-13	10.2	-8	-4	-7	-16	-27
23	13.9	-9	9.8	-8	-3	-5	-13	-23
24	13.0	-7	9.1	-4	-2	-7	-17	-29

VK WEST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.5	10	16.3	13	14	10	3	-7
2	22.0	10	16.6	13	14	11	4	-5
3	22.3	10	17.2	13	15	12	5	-4
4	22.3	11	16.7	15	16	13	5	-4
5	22.1	12	16.6	19	16	14	6	-4
6	20.8	15	15.7	24	20	14	4	-8
7	18.9	18	14.3	29	20	11	-1	-16
8	17.0	22	12.8	30	18	7	-9	-28
9	14.9	25	11.2	27	12	-2	-23	...
10	13.1	27	9.8	23	4	-13	-38	...
11	11.7	30	8.8	18	-3	-24	...	...
12	11.0	31	8.2	15	-9	-32	...	...
13	10.4	31	7.7	12	-14	-39	...	...
14	9.9	32	7.3	9	-19	...	...	...
15	9.7	32	7.3	7	-21	...	...	...
16	9.7	32	7.2	7	-21	...	...	...
17	8.8	34	6.7	1	-30	...	...	...
18	8.8	34	6.7	0	-31	...	...	...
19	8.6	32	6.6	-1	-34	...	...	...
20	9.1	22	7.0	1	-25	...	...	...
21	11.3	17	8.3	10	-7	-26	...	...
22	14.8	14	11.4	15	6	-4	-21	...
23	18.1	12	13.9	15	12	5	-6	-20
24	20.3	11	15.5	14	14	9	0	-11

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.8	16	9.0	11	-3	-19	...	...
2	12.1	6	9.1	6	-3	-15	-33	...
3	15.3	5	12.1	4	3	-2	-13	-27
4	19.6	5	14.9	-1	5	4	0	-8
5	21.0	4	16.4	-5	4	4	0	-7
6	21.0	3	15.8	-7	2	3	0	-7
7	20.9	3	15.8	-8	2	3	0	-7
8	20.6	3	15.5	-7	2	2	-1	-8
9	19.7	3	14.9	-5	2	2	-3	-11
10	18.1	3	13.7	-1	3	1	-6	-16
11	16.3	4	12.3	3	3	-2	-12	-25
12	14.5	7	11.0	7	2	-7	-21	-39
13	12.9	10	9.7	9	-2	-15	-35	...
14	11.7	15	8.8	9	-7	-25	...	...
15	11.1	22	8.3	9	-13	-34	...	...
16	10.5	24	7.9	7	-18	...	...	...
17	10.1	26	7.7	5	-23	...	...	...
18	9.9	28	7.5	3	-25	...	...	...
19	9.8	28	7.4	2	-27	...	...	...
20	9.1	28	6.9	-3	-38	...	...	...
21	8.2	29	6.3	-12	...	...	...	...
22	8.6	29	6.6	-8	...	...	...	...
23	11.0	27	8.2	10	-14	-38	...	...
24	11.3	25	8.7	13	-7	-27	...	...

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.9	4	16.6	-13	1	4	3	-1
2	22.3	7	16.8	-7	4	7	5	0
3	20.6	9	16.5	0	8	9	6	0
4	18.8	11	15.0	7	11	9	3	-5
5	17.7	15	14.0	14	14	10	1	-9
6	16.9	19	13.4	21	17	10	0	-13
7	16.0	23	13.0	26	18	9	-4	-19
8	15.3	27	12.0	30	19	8	-7	-25
9	14.5	29	11.2	29	17	4	-13	-32
10	13.4	30	10.3	28	13	-1	-20	...
11	12.6	29	9.4	23	5	-12	-36	...
12	11.3	30	8.4	18	-3	-24	...	...
13	10.6	30	7.9	14	-9	-31	...	...
14	10.1	23	7.5	9	-11	-33	...	...
15	9.9	15	7.5	7	-11	-30	...	...
16	9.9	6	7.4	5	-9	-25	...	...
17	9.9	0	7.4	3	-7	-21	...	...
18	9.4	-9	7.1	1	-7	-19	-39	...
19	8.7	-18	6.7	1	-6	-18	-37	...
20	9.2	-25	7.1	-2	-7	-17	-34	...
21	11.5	-13	8.5	-2	-1	-6	-18	-32
22	15.3	-4	11.8	-8	0	-1	-7	-16
23	18.7	0	14.4	-13	0	1	-1	-7
24	20.9	2	15.9	-15	0	3	1	-3

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Klama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● HAWAIIAN HAM desires home swap early 1994 with Australian ham. KH6SQ PO Box 351 Pukalani (Maui) HI USA 96788. Non-smokers only please!

● MONSTER CLEARANCE: Connectors at bargain basement prices *UHF connectors:* Connector UHF Cable plug solder RG213 PD259 80c ea (1-9) 65c ea (10 up); Connector UHF cable plug crimp RG58 PD239 80c ea (1-9) 65c ea (10 up); *N connectors* limited stock Andrew Type 44ASW (for Heliax coaxial cable) N male connector 100 % brass, with all accessories including heatshrink sleeve suitable for half inch cable — 80 % off retail: Pay only $17.00 ea; connector N type RG213 male crimp PD9090 $1.90 ea (1-9) $1.50 ea (10 up); connector N type RG62 male crimp $1.90 ea (1-9) $1.50 ea (10 up); adaptor N type female — female in line PD9041 $1.90 ea (1-9) $1.50 ea (10 up); *Capacitors electrolytic: Sprague USA* 75 VDC 99,000 μF +95 degrees C, Height 215 mm, Diameter 75 mm, 3 for $60.00. Please allow for postage and packing. Jim Rogers, 11 Montreal Avenue, Killara, NSW, 2071. Ph (02) 418 1265 Fax (02)498 4466.

● ACCOUNTING SOFTWARE designed by Banking professionals, suitable for Small Businesses, Clubs, Membership Societies, and personal applications. Easy to operate, no special skills required. Financial reports include Cashbook, Profit/Loss, Balance Sheet, General Ledger, and Bank Reconciliation. User amendable Chart of Accounts built-in. Includes manual and on-line support, $265-00. Standalone Invoices module, $240-00. Fully Integrated system of Accounting with Accounts Receivable and Payable, $535-00. General business services, Hardware, LANS etc at competitive prices. 5% discount off all software for AR readers who quote this advert. Samples and demo disks ($10-00, refundable on sale) available.

BOOKMATE COMPUTER SERVICES PTY LTD, 6 Ann Court, Aspendale Vic 3195 (03) 580 6424 Fax (03) 580 8380 (VK3UV) A.C.N. 005 420 548.

FOR SALE ACT

● YAESU FL2100Z with balanced pair new tubes not yet installed s/n IN080418 $1250; ALSO vintage tubes 805, 808, 809 810. Don VK1DH (06) 248 9885.

FOR SALE NSW

● HTX-100 10m mobile xcvr s/n 95000049 exc condn $200. Will consider swap. Rick VK2XRB QTHR.

● ROBOT 400 $380; TELEREADER CWR-685A (updated software) $550; TNC 200 packet radio board $180; SONY ICF-2001 general coverage Rx $240; OLIVETTI M-24 computer $300; ICOM IC-22S $150. Tom VK2OE (046) 21 2228 evenings.

● COMPLETE Oscilloscope home-made, Tube DG7-6, shield, circuit to be picked up $140. Hans VK2AOU (02) 53 9789.

● KENWOOD TS680S HF + 6m in original packing with manual, leads, and (unused) mobile mounting bracket kit, has had minimal use, as new, $1550; MATCHING KENWOOD AT250 automatic tuning unit, good condn, $450; UNIDEN HR2510 25w/10m mobile in original packing with service manual, as new $370. Can ship interstate if necessary. Brad VK2KQH day/early evening (02) 906 5855, a.h. 018 64 0377.

● MORSE CODE trainer programs for C64 free. Send disk postage and packaging. Karol VK2BQQ (02) 957 6808.

● COMPUTERS for packet, IBM-XT turbo 20Mb disk CGA card IBM RAM $175; APPLE 2 plus cp/m starcard $175; ALSO Realistic HTX-100 CW/SSB 10m transceiver $200. Doug VK2KIQ QTHR (02) 587 4989.

● TOWER WINDUP 55ft 2x25 & tube, base pivoted. Hf cubical quad parts, boom, cast and machined spreader clamps, metal reinforced cane spreaders, balun, no wires or rotator $230 ONO. Arthur VK2IK QTHR (02) 876 1465.

● YAESU FT757GX HF AM-FM-SSB C/w Mic handbook and copy of Service Manual. SWR meter auto keyer inbuilt. $985 ONO. Alex VK2DV QTHR (065) 83 7095.

● CRO Double beam Philips PM3230 10 Meg with H/book $300 ONO.Will swap for 2 MX Synth base rig. CRO available for inspection Melbourne. Phone Don VK2BDU (058) 81 1267.

● YAESU FRG7700 Rx GC $300.00. YAESU FC700 ATU six months old $225. 12 V 20 A PS homebrew $200. ELECTRONIC KEYER with inbuilt PS $70. All equipment in excellent condition. Noel VK2BCA (047)39 6255 between 5pm and 9pm only.

FOR SALE VIC

● YAESU FT-ONE, HF all band xcvr, mint condn, DC cables, MD-1 mike, manuals, $1500; HEATHKIT HD1410 iambic keyer, exc condn, manual, $100. Noel VK3FM QTHR

● BENCHER Iambic paddle with shielded lead and plug for direct keying to any of the modern tranceivers,as new condn $95. Roth VK3BG (03) 725 3550.

● ALINCO VHF RF Pwr amp exc condn $120, DTMF decoder board $130, VHF Rx Valves $3 ea and transit $10 ea, Apple 128K ram card $80, IBM XT disk controller card $40, XT IBM motherboards $40 ea, AWA VHF carphone $25. Vincent VK3AJO (03) 872 3503.

● KENWOOD transceiver TS440S s/n 8050449 $1825; KENWOOD power supply PS50 30amp s/n 8060195 $400; DENTRON GLA1000 400w linear $475; ICOM SP2 external speaker $50; SHURE 444D desk microphone $75. John VK3BIL (03) 762 2119.

● SHURE 444D base microphone original manuals and box pc $100; KENWOOD MC-50 pc manuals $85. Paul VK3EPD (059) 83 1771.

● FT101 CW filter 1.8MHz 10MHz spare finals $500; FV-707DM remote vfo $250. Ron VK3AEO (03) 707 3405.

● YAESU FT1000 HF trans compl with b/pass filter unit mic h/book, as new condn $4200 (consider part trade on HF transceiver); COLLINS 30 S.I. linear amp exc condn $2500. Rob VK3JE (060) 37 1262.

● ICOM IC 701 HF Xcvr 100 watt with 701 PSU complete with all leads and manuals. VGC. Serial No 03901 $675. Allan VK3QL (03)754 7943

FOR SALE QLD

● COLLINS Transceiver latest current model KW380 all amateur bands HF on tx full coverage HF on Rx mint condn remote control accessory $2500; ALPHA Linear model PA77SX s/n2894 USA export model exc condn all amateur bands HF $6000, licenced amateurs only. Theo VK4MU QTHR (07) 263 4041.

● KENWOOD TS-520S txcvr 1.8-30 MHz 200 watts pep with mike little use original carton plus manual no mods PC lic amateurs only $500. Trevor VK4ARB QTHR.

● DECEASED ESTATE. Written offers are invited from licenced radio amateurs for the purchase of the following KENWOOD equipment. It has been well cared for and is in original packaging with manuals, cables and accessories excepting the rotator motor which will be properly packed for despatch. TRANSCEIVER TS440S s/n 7051835; POWER supply PS430

s/n 3050189; COMMUNICATIONS loudspeaker SP230 s/n 1020248; KENROTOR KR800S s/n MS87-11. Offers from licenced amateurs to VK4BBL QTHR by 31st August please, as agent.

● PHILIPS FM320 mic ant transwest pwr supply; MIDLAND HF 27 meg t/c, mic, stand, vert ant coax etc. Mobile or Base rig. Accept reasonable price. H. Harmer VK5AUS QTHR (08) 344 5011.

● EIMAC 4CX250BC Premium grade tubes. Brand new $25 ea. AMPEREX 4CX350A tubes brand new also $25 each. David VK4DH (07)274 2155 B/H, (07 378 9869 A/H.

FOR SALE SA

● HOUSE and vacant block suitable for amateur Mt. Gambier P.O.A.
John VK5JT (087) 25 6170.

● ICOM IC-725 Hf SSB/FM/AM txcvr s/n 02174 $1100; ICOM IC-271A 2m m/mode txcvr 25w s/n 27402137 $1000. Both in exc condn c/w manuals orig packing mic etc. Terry QTHR VK5ATW (088) 63 1268.

● PHILIPS FM320 mic ant transwest pwr supply. MIDLAND HF 27 meg T/c. Mic. Stand. Vert ant coax etc. Mobile or base rig. Accept reasonable price. H C Harmer QTHR (08) 344 5011.

FOR SALE TAS

● KENWOOD TS530S HF xcvr s/n 11201024 c/w hand mic instr manual orig pkg exc condn $600. Mike VK7ME QTHR (004) 38 1217. Licenced amateurs only.

● ALINCO DJFIT Micro sized 2 metre H/held inc leather case, new. Rec. 118 — 174 MHz Xmit Ham bands DTMF Tones $450. YAESU FRV7700 VHF Conv 110 — 184 MHz 50 MHz suit FRG 7700 $135. Allen VK7AN (003) 31 7914.

WANTED ACT

● HF COMM Rx any fixable condition by budding Novice for Morse practice VK1PG (06) 248 8884.

WANTED NSW

● COLLINS 62S-1 transverter, Collins SM-1, SM-2 or MM-1 microphone, Collins 32-S1 transmitter, 516F-2 psu, good quality valve tester. Tom VK2OE (046) 21 2228 evenings.

● YAESU FT707 with power supply or similar portable rig in good condition. Kevin VK2BJK QTHR (02) 449 1598.

● HY-GAIN TH3 junior has to be in A1 condition or still in box. Peter VK2FFA (043) 24 4160.

WANTED VIC

● FM-430 FM option for TS-430S. Paul VK3EPD (059) 83 1771.

● BOOK, Meters and Scopes by R J Traister, or Electronic Test Equipment Handbook by Steve Money, or a handbook that describes how to use test equipment. Not too technical. Reasonable price. Allan VK3QL (03) 754 7943.

WANTED QLD

● FDK MULT-800D circuit or manual to repair this 2m FM xcver as the importers have nothing, YAESU FT-ONE data, Mitsubishi I.C.S or replacements MN9005 CPU, MN1201A and MN1203 RAM, MB8718M pll. Dennis VK4ADY QTHR expenses paid phone first (074) 65 2226.

● SK620, SK630 sockets 3CX800A7 valve and socket. 1000D 200 — 500 MHz or 1000C 100 — 250 MHz. Bird 43 inserts. David VK4DH (07) 378 9868 A/H, (07) 274 2155 B/H.

WANTED SA

● TWO EM34 valves for restoration project all expenses met. Kurt VK5KI QTHR (08) 264 1902.

WANTED WA

● EIMAC 3-500z valves (pair), preferably as new; also KENWOOD PS-30
DC power supply, to suit TS130S. Steve VK6VZ QTHR (09) 349 9703.

MISCELLANEOUS

● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STO code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958
MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

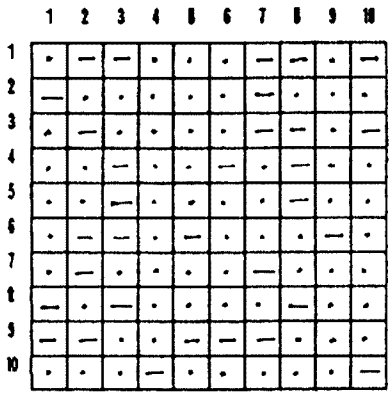
VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

Solution to Morseword 77

Page 51



Solution to Morseword 77
Across: 1 Punt; 2 Bus; 3 Lima; 4 Fare; 5 Feel; 6 Waste; 7 Rile; 8 Tried; 9 Mums; 10 Viv.
Down: 1 Lip; 2 Kitten; 3 Named; 4 Hist; 5 Suite; 6 Steve; 7 Oven; 8 Noel; 9 Hens; 10 Cha.

Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

A simply brilliant price

$449

Cat D-3600

YAESU

'Quality and Reliability You Can Afford'

ICOM

Count on us!

Ham heaven.

Some days Duncan thinks that he must have died and gone to heaven. Whichever way he turns he is surrounded by the finest ham radios around. What's a guy to do? He plays with them all day. And if that wasn't good enough, he gets paid for it as well.

Duncan Baxter... well VK 3LZ actually, let's call him by his 'real' name, is our resident ham radio expert. No one knows the Icom range better than VK 3LZ. He's been with us virtually from the start, some ten years in fact.

Now, if you'd like to find out about the latest in transceivers, or virtually anything else to do with amateur radio operation, why not give VK 3LZ a call. Or you could simply drop in and see him at ham heaven... err... our head office that is.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call: (008) 338 915 Ph: (03) 529 7582 Fax: (03) 529 8485 A.C.N. 006 092 575

LL BROWN ADVERTISING 4506

AMATEUR RADIO

SEPTEMBER 1993
Volume 61 No 9

Journal of the Wireless Institute of Australia

IN THIS ISSUE:

ANTENNAS —

SMALL WITH BIG RESULTS
ALL BAND VERTICAL
HIGH PERFORMANCE 20 METRE WIRE
NO SWITCHING Z MATCH TUNER

KENWOOD

...pacesetter In Amateur Radio

Compact Milestone

Kenwood unveils the world's smallest HF transceiver

HF is going places—thanks to Kenwood's new TS-50S, the smallest transceiver of its kind in the world. Providing high-performance communications with go-anywhere convenience, the TS-50S is your passport to freedom. And whether used for mobile operations and DX-peditions, or in a fixed installation, this rig packs a powerful punch. Maximum output is 100W, and there's a full range of advanced features—including 100 memory channels, DDS with innovative "fuzzy" control, and AIP for superior dynamic range. IF shift and CW reverse mode help reduce interference, while a noise blanker improves clarity. For user-friendly operation on the move, there's a multi-function microphone and powerful menu system. And the TS-50S is fully equipped for split-frequency operations. Test drive one today.

TS-50S
HF TRANSCEIVER

NEW

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD
(ACN 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre
Homebush, NSW 2140, Australia Tel (020 746 1519
Fax. (02) 746 1509
NSW Emona Electronics Sydney (02) 211 0988
Lake Macquarie Communications Cardiff (049) 587 255
ACT Watts Communications Fyshwick (06) 280 8416
QLD Kenwood Communications Albion (07) 357 6830
VIC Strictly Ham Bayswater (03) 729 7656 Stewart
Electronics Components Huntingdale (03) 543 3733.
SA International Comms Systems Port Adelaide (08) 473 688
WA Leda Electronics St James (09) 361 7821
Tower Communications Victoria Park (09) 470 1118
TAS Elgin Pty Ltd Launceston (003) 312 711.
Elgin Pty Ltd Hobart (002) 344 5000
FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

Journal of the Wireless Institute of Australia

Vol 61 No 9 ISSN 0002-6859 September 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP
Publisher
Bruce Thorne
Editor
Bill Rice VK3ABP
Acting Production Editor
Bill Roper VK3BR
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
WIANEWS Editor
Roger Harrison VK2ZTB
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
June Fox
Brenda Edmonds VK3KT
CIRCULATION
Chris Russell VK3ARZ
Sue Allan

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
October	06/9/93	8/9/93
November	11/10/93	13/10/93
December	08/11/93	10/11/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA.

CONTENTS

Cover
KH5 — Kingman Reef is completely submerged except for an 800 foot long gravel bar near the south-east point which averages 10 to 20 feet in width. Doug VE5RA is working on a DXpedition antenna. Note the ends of the beam elements extend over the opposite edges of the land! For more information see Stephen Pall's "How's DX" column.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

Federal Secretary
Bruce Thorne
Office Manager
Donna Reilly

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Naliawaila	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Federal QSP

You may recall seeing an advertisement in the May issue of Amateur Radio for the positions of Company Secretary and Office Manager for the WIA. This was occasioned by the resignation of Bill Roper, the General Manager and Secretary. After a busy round of interviews, these positions have now been filled and Bill has been able to effect his resignation. Elsewhere in this issue you will see some details of Bill's achievements in his time as General Manager, so I won't go into them here in any detail, other than to record my thanks to Bill for a job well done. He leaves this organisation in much better shape than it was when he started in the position and we wish him well in his new endeavours.

The new faces in the Federal Office are Mr Bruce Thorne as Company Secretary and Ms Donna Reilly as Office Manager. We welcome them both and wish them well in their new positions. Having only just recently taken over their positions, they are both feeling their way and becoming accustomed to the culture that is amateur radio. I ask you all to bear with them as they adjust to their situation and come up to speed. In some ways we amateurs are a strange lot and we take some getting used to. However, I am sure that Bruce and Donna will soon be handling the running of the office like veterans.

On another tack, I would like to take up a point raised in a recent Divisional Broadcast. It concerns how we see ourselves and how we wish others to see us. We all take pride in being amateur radio operators — we have passed an examination and we have a certificate to prove that we are eligible to be amateurs. Many of us would like to encourage others to also become amateurs but how many of them are turned off the whole idea when they see the inside of "The Shack".

I must admit that my shack is at times a little on the disorganised side, with the odd cable or two running across the floor. I have seen better shacks than my own, as well as worse ones, some much worse. Have you ever thought about the image you project to others through the look of your shack? After the antenna farm in the back yard, it is probably the next most visible aspect of your operation. All too often we leave the matter of station engineering, and that's what it is, engineering, to another time and somehow it never gets done. Yet while we continue to operate in untidy conditions amongst a rat's nest of cables of assorted types, how are other people going to consider our hobby seriously enough to join. The better the image we can project to those who come to see and know us, the more chance we have of being able to encourage more people to become amateurs. Without a solid and growing body of amateurs it becomes ever more difficult to justify our privileges and band space against the increasing commercial pressures which are coming to bear on the government.

So how about setting yourself a project for the coming months — turn your skills as an amateur to the matter of the engineering of your station and clean up the mess. Turn it into something of which you can be proud and want the world to see. In the process you will certainly make it easier for yourself to operate. Maybe the coming Christmas break would be a good time to start work, after a couple of months of careful planning.

Kevin Olds VK1OK
Federal President
ar

Departure of Bill Roper as General Manager and Secretary

The keen eyed among you will have noted that this issue no longer shows Bill Roper VK3ARZ (now VK3BR) as the General Manager and Secretary of the WIA. After five years in the position, Bill has left to pursue other interests. In his five years in the position Bill has achieved many things, some of which you may be aware. However, to many, some of Bill's achievements will not have been obvious as they have been achieved behind the scenes, often with very little visible result except to the Federal Council.

Bill was already well known to many amateurs when he commenced work as General Manager and Secretary in the Federal Office in 1988 through his long association with the Federal Tapes as one of the co-presenters. It may be said that he shares the honour of being one of the best known voices in amateur radio through his exposure on weekly broadcasts by means of the Federal Tapes.

When he started in the Federal Office, Bill was faced with an organisation that was run down with very little by way of financial reserves; office procedures were practically non-existent and very little use was being made of computing assistance in the office tasks. Bill tackled the job with energy and enthusiasm and has been able to achieve a major turnaround in the WIA's fortunes at the Federal level.

The operation and efficiency of the Federal Office have been vastly improved. The office now provides a standard of service that is much appreciated by all those who communicate with the WIA at the federal level. This has been made possible through the introduction of improved office systems, most of them computer-based, and the development of associated procedures and staff training. On the financial front, the WIA is now a viable organisation in the financial sense, with an extensive financial and statistical system in place to support

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts		1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Roger Harrison Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2ZTB	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to *Australian resident* (F) (G) (X) grades at fee x 3 times.

the Federal Council in its deliberations. The improvements in the performance of the office have been accompanied by an improved financial performance that has assisted the financial turnaround.

This financial turnaround has also been evidenced in the area of publications where, through Bill's prudent financial management and hard negotiation, the production costs of Amateur Radio magazine have been contained and actually reduced, despite continuing increases in the CPI. Bill was also instrumental in obtaining from the Australian Government Publishing Service the long term contract for the WIA to publish the Australian Radio Amateur Call Book.

Of a more visible nature, Bill was largely responsible for the improved liaison with the DoTC (now the SMA) which saw the successful negotiation of new and improved licence conditions for the amateur service. These conditions will see Australian amateurs move into an environment which contains far fewer regulations and impediments to the experimental nature of the amateur radio service. The new conditions will be the envy of amateurs worldwide and it is only because of the government calling an election and then establishing the Spectrum Management Agency that these new licence conditions have not come into force before now.

Bill also played a major role in the establishment and operation of the WIA Exam Service, which now provides an examination service to the amateur community and those aspiring to become amateurs, which is second to none. Flexibility in the timing of exams and prompt return of results are an integral part of the system which compares very favourably with those in use overseas.

To Bill we say a big thank you for all you have done in your time in the Federal Office and wish you all the best in your new endeavours.

Kevin Olds VK1OK
Federal President
ar

High Performance 20 Metre Wire Antennas

*Adrian Fell VK2DZF * has had good results with his version of the quad loop and 3/4 wave vertical.*

Described in this article are two simply constructed wire antennas that have proved to be excellent performers for DX communications on the HF bands at the author's QTH. Although these designs are not expected to compete with multi-element types they may surprise many operators with their overall consistently good performance. To simplify construction and to keep costs to a minimum, wire is recommended for the radiating element in the vertical design. Above 14 MHz, tubing can of course be utilized; the choice is yours, the only considerations being mechanical. If you are lucky enough to have a few trees in your property then why not take full advantage and use them to get some easy sky hooks. These designs not only perform extremely well but no special matching networks are required at the feed point, thereby keeping construction simple and costs low.

The Quad Loop

This is probably my favourite antenna for use on the HF bands, although its sheer size may deter some, especially on the lower frequencies. If one can arrange for its construction then they will be rewarded with an antenna that is not only good on transmission, for both local and DX, but is also an excellent receive antenna which is very quiet, with low pickup of manmade and other noise. From experience, the loop has the advantage when it comes to low TVI as well. This is a big plus for the suburban amateur operator. Costs can be kept to a minimum on this antenna by not using spreaders, although at 10 or 15 m it may be much easier to use them anyway. For support, why not make use of any trees and/or the house to get on the air? The shape doesn't have to be square, but I have stuck with this arrangement as it has proved itself time after time for me.

Construction and Adjustment

In the December 1991 issue of AR, the author described a gamma matched quad loop. That method could be complicated to construct and difficult to adjust when in the air, so this latest design has been simplified somewhat. It is recommended nevertheless that a 75 ohm impedance transformer be used between the loop (feed impedance about 120 ohm) and the 50 ohm coaxial feeder cable, especially if you own a solid state transceiver. This will give an excellent impedance match resulting in an SWR of 1 to 1, if the antenna is well clear of surrounding objects and adjusted correctly.

The 75 ohm cable for the impedance transformer can be obtained from Tandy stores. Their part no is 278 1327. Although this cable isn't the best quality it will do the job if no other 75 ohm cable is available. Once resonance has been established (check where the dip point is), then shorten the loop by say 5 to 7 cm at a time until the dip point is where it is wanted. The loop has a great bandwidth so adjustment isn't that critical, but the antenna should be at its final height if the readings are to be accurate.

It is suggested that the formula 306/F(MHz) be used as the starting point for the loop circumference (in metres). Make this calculation for the middle of the band, or towards the low end of the band. This way should allow ample length of wire for adjustments.

If you are sure that the loop will be in the clear, well away from all objects, then you could use the formula 304/F. Then the calculations should be made for the low end of the band.

The loop is a balanced antenna, but the feedline is unbalanced. Therefore some RF current will flow on the coax shield because of this unbalanced condition. We can take advantage of this situation by inserting an RF choke one quarter wavelength down from the feedpoint. This section then becomes part of the antenna, causing the normal "figure 8"pattern to be somewhat distorted. This will allow some extra pickup and transmission in directions not normally found with a gamma fed loop in the same position. Tests with both types of feed have confirmed this conclusion. The quarter wave section should drop away at right angles from the loop. The velocity factor of the cable should be allowed for in determining the quarter wave section length. This will be 0.66 in most cases, but don't worry if you are a little short in length. It's best to use RG58C/U (etc) cable from the transformer to the shack, because of weight (and cost) considerations. If the feedline is very long then use RG213

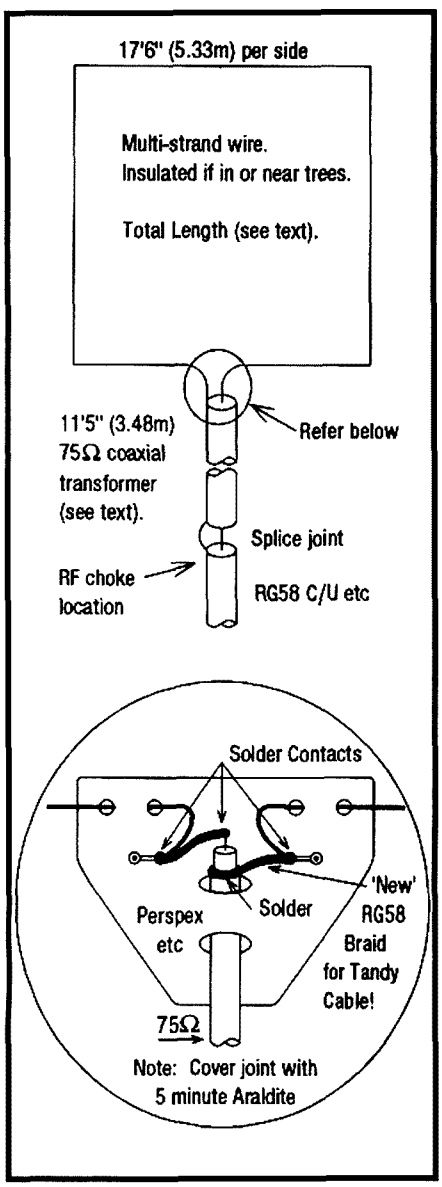


Figure 1 — The Quad Loop Antenna.

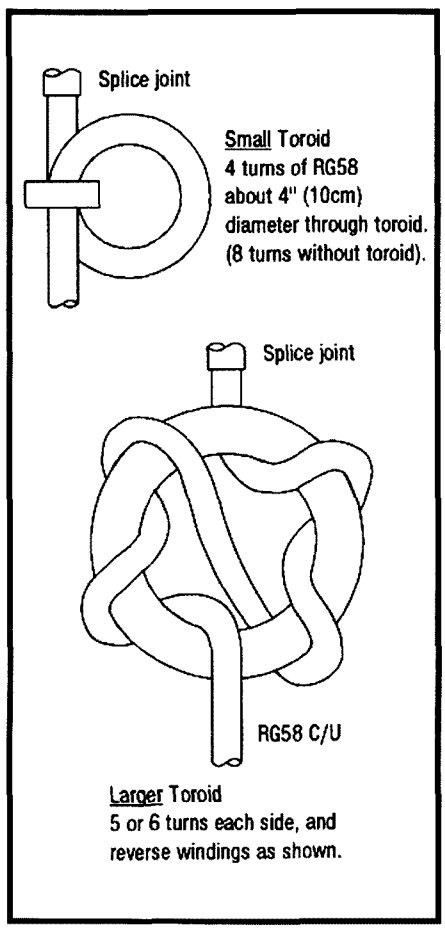


Figure 2 — Alternative RF Chokes for the Quad Loop.

or RG8 etc. The loop is an efficient antenna so losses are going to be very low anyway.

The RF choke can be constructed in a number of ways, so first check the junk box and see if there are any toroids about as this will determine how to wind the choke. Figure 2 shows some suggestions for different types. The insertion of the choke will also help stop RF from coming back into the house and causing TVI, so it is important to have it there in some form or another.

If the loop is to be constructed with the intention of rotation, then the RF choke might better be located right at the feed point.

Although this antenna will perform well at low heights, it will excel if the loop is elevated as high as possible. I have been able to get my 20m loop up to 20m to the top, between two trees — until it came crashing down!

I shall put it up again, I hope, but in the meantime I am having great success with the 3/4 wave vertical.

Performance of Loop

As mentioned earlier, the loop is bi-directional (figure-of-8, bird's eye view) so allow for this before installation. The lobes may be distorted somewhat by design shape, by nearby objects and by height above ground.

With stations that appear in the direction of these lobes of radiation, this loop should outperform the vertical mentioned in the next section, assuming the antenna is located at a reasonable height above the ground. However for signals off the side of the loop, the 3/4 wave vertical should be superior.

So if you have a favourite direction for DX, then try and aim the loop at this point. If you prefer to roam about the bands then the vertical described next may be the best choice. Remember though that the loop is bi-directional so it will beam both long and short paths at the same time.

The 3/4 Wavelength Vertical

To quote the ARRL handbook: "When the height of a vertical antenna is increased beyond a half wavelength, secondary lobes appear in the (vertical) pattern. These become major lobes at relatively high angles when the length approaches 3/4 wavelength".

Despite the above I have found this length of vertical to be an excellent antenna for working DX on the HF bands,particularly 15 and 20 metres. Not only is performance very good but no impedance matching networks are required, thereby making possible a direct connection to low impedance cable.

The antenna will have some gain; it's like having a half wavelength vertical elevated one quarter wavelength above ground. In comparative tests a half wavelength

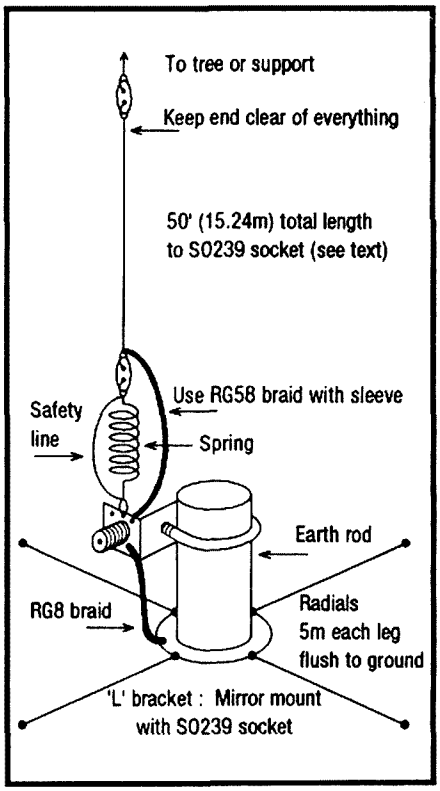


Figure 3 — The 3/4 wave Vertical Antenna.

mounted near the ground performed poorly.

I suggest that the bottom end of any HF half wavelength vertical be at least 1/8 wavelength from the ground. This has been suggested in RSGB antenna publications as well. Unfortunately 3/4 wavelength on 20m makes for an awfully long radiator, but with the use of a few trees it can be done. The top can be bent somewhat, or a little top loading in the form of a capacitance hat added, if getting the height is a problem.

Ground Radials

This antenna will operate at high efficiency with low losses without the need for an elaborate ground system. Four 1/4 wavelength radials buried beneath the grass and a ground rod should do the trick. A spade slot can be made quite easily in damp soil to run the radials. To be fair to any potential constructor of this type of antenna, I should point out that my ground radial system consists of a total of 500 metres of 1mm copper wire. This, together with ground rod was installed prior to laying down the turf in our back yard.

There are various lengths cut to 0.2 to 0.25 wavelengths between 10 and 40 metres, although gardening has cut a lot of these lengths in half over the years! The ground rod at the central point (from where the RG213 runs to the house) is kept moist with occasional water from the hose. So the whole system is a good earth!

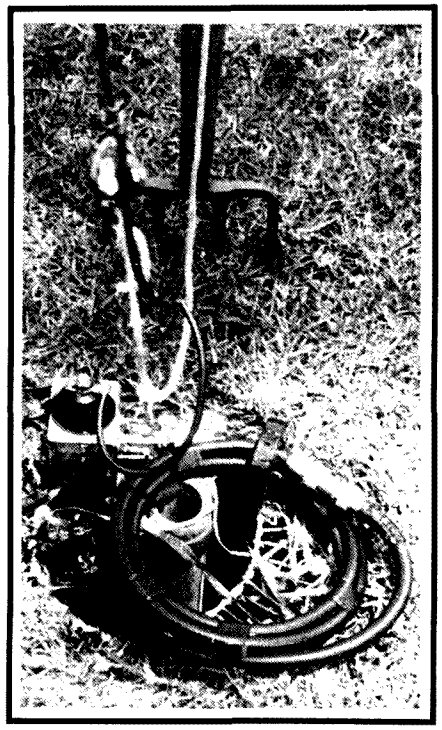
Tuning the Vertical

Start with a bit more wire than is required. For 20m, 15.5m should be ample to get started. Minimize the VSWR at your favourite portion of the band by shortening the wire a little at a time and observing the SWR. It should come down to 1 to 1 at resonance. Note though that the band width of this vertical is not as good as the loop.

Performance

From experiments conducted on 15 metres, the vertical should perform the same as a horizontal 1/2 wavelength dipole mounted at 1 wavelength above the ground.

Local stations and near VK states will be down slightly in strength compared to the loop or any similar horizontal antenna. DX on the other hand should easily be worked

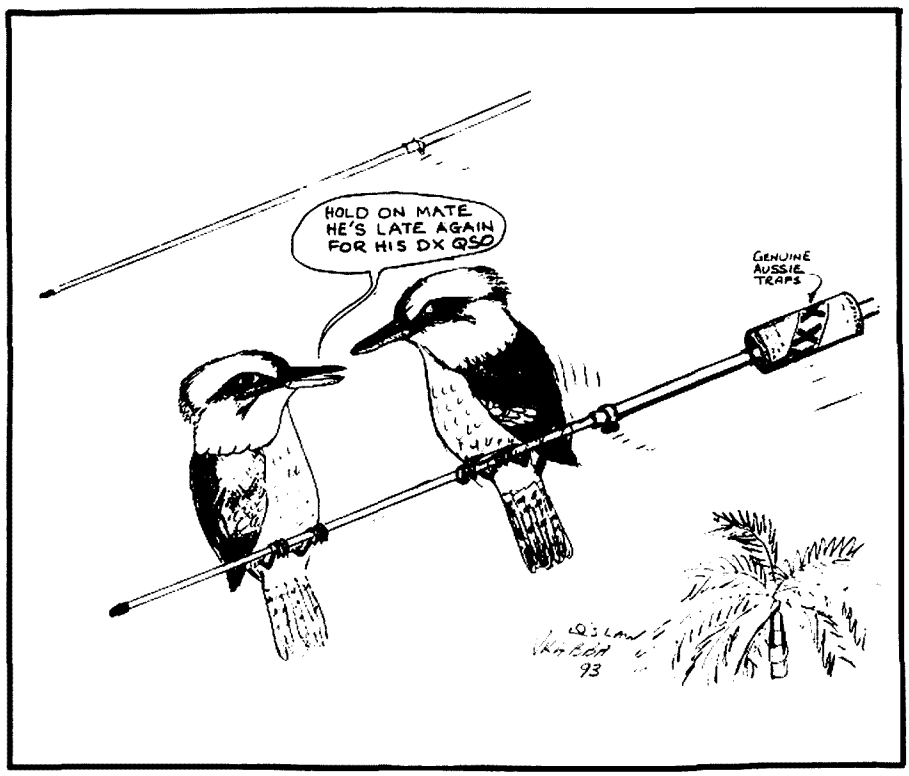


Ground rod and radial for the vertical. Four or more should suffice for the 0.75 wave design.

(especially on CW), but do expect some QRM and QRN because of the omnidirectional pattern. Well — you can't have everything!.

* *PO Box 344, Baulkham Hills NSW 2153*

ar



A Z Match Tuner — Two Coil Windings But No Switching.

Lloyd Butler VK5BR discusses another Z match tuner idea which gets rid of the two outputs and the output switching.*

In recent months, there has been quite a lot of constructing and testing of single coil Z match antenna tuners. Various experimental coil arrangements have been assembled in Melbourne by an enthusiastic radio amateur and these have been sent on to me for technical assessment. The first of these units was based on a tank coil tuning idea submitted by Joe Rogers VK3TO in AR October 1953.

In this particular arrangement, there were two coil windings on a single common coil former but spaced well apart. I pointed out that this was really a two coil design since the windings were not mutually coupled and therefore individual inductors in their own right. From then on, further work was aimed at a unit more closely based on the ZL3QQ single coil system. Notwithstanding this, we were able to get the VK3TO type coil arrangement working as a Z match and I thought that its operation would also be of interest to readers.

The VK3TO Tank Circuit

The circuit arrangement and coil assembly for the VK3TO multi-band tank circuit are shown in figures 1 and 2 respectively. C1-C2 is a split stator capacitor which in conjunction with L1 and L2 form the tank tuning. In essence, the larger coil L1 tunes the 3.5 to 7 MHz bands and the smaller coil L2 tunes the 14 to 28 MHz bands. On the lower frequency bands, L1 couples directly into a link winding L3 to feed the antenna line. On the higher frequency bands, L1 acts as the primary of transformer L1-L3 to couple L2 into the antenna line. As shown in figure 2 the windings are fitted on a common two inch former for convenience but are sufficiently separated that any mutual coupling is small. If required, separate formers could be used. The link output winding L3 is closely fitted over the cold end of L1.

The important feature of interest is that the tank tuning system covers amateur bands from 3.5 to 28 MHz without any switching.

The idea of a tank circuit with two resonant tuning ranges is certainly not new and I found other references in my files. Allen King Jr W1CJL published an article in QST, March 1948 titled "No Turrets — Just Tune".

The important feature of interest is that the tank tuning system covers amateur bands from 3.5 to 28 MHz without any switching.

Vernon Chambers W1JEQ submitted a tank circuit identical to the VK3TO circuit. His article published in QST July 1954, was titled "Single Ended Multiband Tuners". Incidentally, the same Allen King W1CJL is credited with first introducing the well established two coil Z match tuner as we know it (refer QST May 1955).

The Z Match

Now here is where our Melbourne Z match constructor is introduced. He figured that he could use the VK3TO tank circuit as the shunt element of a Z match tuner. The coil assembly

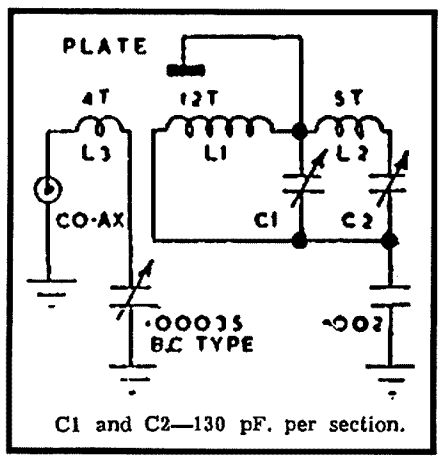


Figure 1 — The VK3TO Multi-Band Tank Tuning Unit (from AR, Oct 1953).

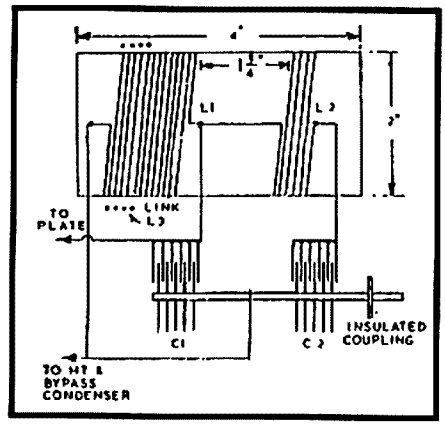


Figure 2 — Assembly — The VK3TO Tuning Unit (from AR, Oct 1953).

was duplicated and it was only a matter of adding the series tuning capacitor connected between the 50 ohm input and the hot end of L1. The next job was to see what it could do and that was my task.

As it turned out the coils had too much inductance for the Z match function and in particular I could not get satisfactory matching on 7 MHz and 28 MHz. In the light of how the Z match works this was understandable. Referring back to our previous articles, we have described the Z match as an L network of series capacitance and shunt inductance. To make the shunt element look like an inductive reactance, the shunt circuit is offset from its resonant point. This is done by reducing either shunt capacitance or shunt inductance. If the resonant point of the two components occurs when the variable capacitor is set near its minimum value, then the inductance must be reduced by reducing the number of turns. This was the case at 7 and 28 MHz and to improve operation, I reduced the 12 turn large coil down to 8 turns and the 5 turn small coil down to 4 turns. The resultant circuit is shown in figure 3.

If you look at a standard two coil Z match circuit and just remove the secondary winding of the smaller coil unit you find exactly the same circuit as we have in figure 3. The calculated inductances for figure 3 are 3.37 microhenries for the large coil and 1.14 microhenries for the small coil. These values are close to those used in the two coil Z match. So we really have a normal two coil Z match with only one output coil and no switch.

Performance

With the coils modified as discussed, I was able to achieve a match to 50 ohms input over the load resistance range of 10 to 2000 ohms for the frequency bands of 3.5, 7, 14 and 21 MHz. At 28 MHz, it would match for 75 ohms upwards. I did not think too many people would want to use a Z match tuner at 28 MHz and I did not try too hard to get a match below 75 ohms. To achieve the matching range, the variable input capacitor requires a capacitance range of 20 to 400 pF and the split stator capacitor a range of 18 to 210 pF.

Referring back to tests I carried out on the Compact Coil or Rononymous two coil Z match, Amateur Radio, December 1990, we see that, on most bands, outputs coupled from both coils had to be used to obtain a wide impedance load range. Now I have already pointed out that our Z match based on the VK3TO tank is in fact a two coil unit with output coupled from only the larger coil. The conclusion I have to reach is that, by carefully adjusting the inductance of the coils, the conventional two coil Z match could also have been made to work using the one output coupling winding. We learn something every day!

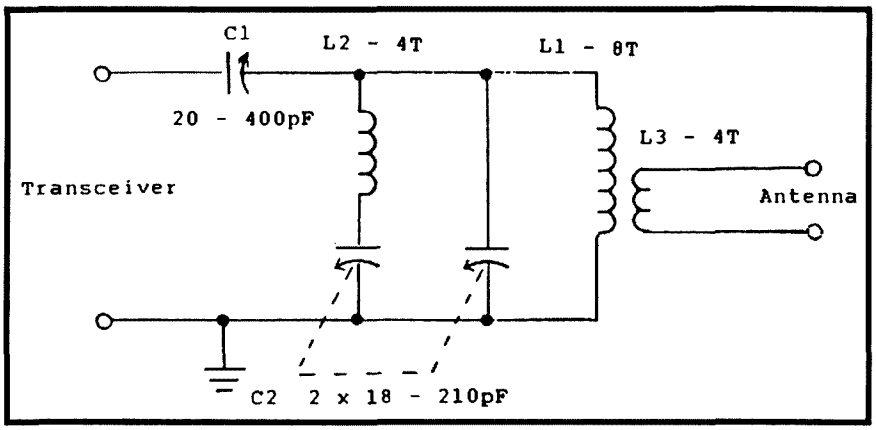


Figure 3 — The Z Match Tuning Unit. Two coils but no switching.

Coil assembly detail

Details of the modified coil assembly, which produced the results given, are as follows: The two primary coils, wound with 18SWG tinned copper wire, are spaced 38mm apart on a common former as shown in figure 2. Winding diameter is 52mm and the turns of wire are spaced 3mm apart. The larger coil (L1) which has 8 turns is therefore 24mm wide and the smaller coil (L2) which has 4 turns is therefore 12mm wide. The coils are air wound with windings held in place by insulating strips. The 18 gauge wire seems a bit light for the application, but I have measured the

coil unloaded Q factor and it runs well above the 100 mark.

The coupling coil (L3) is 4 turns of insulated hook-up wire closely wound around the cold end of L1. The degree of coupling affects the matching range and the coupling can be reduced, if necessary, by sliding L3 a little over the end of L1.

Summary

Here is another Z match tuner idea which gets rid of the two outputs and the output switching. It is not the same as the single coil Z match we have been writing about so much lately but it makes use of alternative coil arrangement to achieve much the same thing.

References

1. Joe Rogers VK3TO — Multi-band Tuning Unit — Amateur Radio October 1953.
2. Lloyd Butler VK5BR — Tests on the Compact Coil Z Match — Amateur Radio, December 1990
3. Random Radiators — (VK3AFW & VK3OM) The "AR" Single Coil Z Match — Amateur Radio, February 1993.
4. Lloyd Butler VK5BR — The "AR" Single Coil Z Match — Amateur Radio, April 1993.

* *18 Ottawa Avenue, Panorama SA 5041*

ar

WIA News

New RSGB President

An announcement from the Radio Society of Great Britain (RSGB) tells us that Ian Stuart GM4AUP, a Scotsman, has been elected President of the society for 1994.

Ian is currently the RSGB Council representative for Scotland and chairman of their data communications committee. Obviously, a packet enthusiast, as is our President, Kevin Olds VK1OK.

Remember to leave a three second break between overs when using a repeater.

Simply, An All Band Vertical

*George E Thatcher VK2EHN * finds that old antenna designs are still far from the scrap heap.*

The late Clive Cook's article, published in October 1992 AR about the 1927 Antenna design leads me to report that just a few days ago, I installed a device apparently based on this 1927 concept and must report that the sceptics (including yours truly) are standing by with amazed (changed from amused) expressions.

Around five years ago I bought, from the Brisbane based maker, a device known as the Black CTW Antenna Coupler. The rush of blood subsided and I could find no use for this unit — until last week, when I had need of a compact (in terms of ground space) all band antenna which this coupler was claimed to produce.

Application notes supplied called for a vertically mounted tube, around 12 metres overall length. With some still lingering doubts and an eye on the budget, I purchased some aluminium tube, 6 metres long by 36mm O/D plus two shorter telescoping tubes. The resultant assembly measured 11.8 metres. Close enough, according to the info. Next, I threaded the supplied single insulated flexible cable through the tube and electrically attached the conductor to the top end. Incidentally, I found that a used champagne cork was ideal to use as a stopper at the top. The bottom end of this cable was brought out through a 10mm hole at the base.

This construction was gingerly raised (it is really quite flexible), attached at a height of 3 metres to a timber pergola and seated into an insulated base. The "Black" box, (CTW Antenna Coupler) consists of a white plastic tube about 200mm long and 75mm in diameter, with a support hook at the top and an SO239 socket at the base. Also protruding, are three cables. One is a red, single insulated flexible wire, about 300mm long. The second is a similar black wire, whilst the third is known as a counterpoise, 12 metres long and about 3mm in diameter. I suspect this is coaxial cable but decided not to interfere with this well attached item.

Following the notes, the red wire was connected to the inner conductor of the antenna, the black was connected to the outer skin whilst the counterpoise was distributed through the garden bed. The Black Box was attached to the antenna base using nylon ties.

Everything looked shipshape, so, using a length of buried coax, (aesthetics/the XYL required a non-visible cable) the now complete vertical antenna was connected to my FT1000.

At very low power with the inbuilt tuner operating, everything checked out fine. However, here is the problem; even without the tuner in circuit, the antenna is virtually flat from 1.8 MHz to 30 MHz. Granted, a dummy load will also do this so the scepticism was really put the test.

Signals were coming in from everywhere. In some cases the S-meter was reading higher on the CTW vertical than on a properly directed 2 element beam (not always, but sometimes). Possibly something to do with phasing or approach angles?

The real test was transmitting, and this has also proven most gratifying. Local contacts in the lower bands have brought great reports and some really good DX. G, K, I, EA, JA, and many others have given me good reports. Quite amazing or surprising, I am not sure which.

There does appear to be some loss in the coupling unit as there is a small temperature rise on the case surface. Nevertheless, a worthy antenna.

It seems that Emil Geles idea in 1927 of a coaxial travelling wave antenna was practical and successful. Perhaps the Brisbane people developed or improved upon same by perfecting the coupling unit.

* *"Wirraburra"*
26 Scribbly Gum Avenue Tallong Park
TALLONG NSW 2579

ar

A Small Antenna with BIG Results

*Jim W Duggan VK4BOK * offers a solution to the problem of a truly portable antenna system.*

As a ham in the USA, WA2LEW, I bought a small portable vertical whip antenna for around $50.00. I was intending to use this antenna in a military-like barrack situation in Seattle, Washington for the next year or so. I was stationed in Seattle as an Ensign, working for the US National Oceanographic and Atmospheric administration (NOAA) Corps aboard the Hydrographic Survey ship DAVIDSON. When in port I had the time to enjoy ham radio and mounted the vertical on the window sill of my quarters. It was connected to a Heath HW101 Transceiver and a Heath SA 2040 Antenna Tuner. The vertical whip was a Barker and Williamson (B&W) Model 307-10 and included with it were 4 (base loading) coils for 40-10 metres, a counterpoise and a mounting bracket.

Using my SWR/Power Meter I tuned the antenna by first coiling the counterpoise around my hand to the approximate position as marked on the counterpoise wire. The counterpoise was then placed on the floor of my room and the antenna was then tuned to obtain an SWR of 1:1 on 20 metres using the antenna tuner. Power output was about 70 watts.

I started calling CQ on about 14.050 and had answer back from a VE7 in Vancouver. This was good, as my antenna was at least working. However, my next QSO was with a station from New Jersey with signals of 569 there. Throughout the year, this one kilogram antenna performed admirably, as it was only at about 2.5 metres above the ground.

My second impressive experience with this antenna was on a little adventure to an island off Newfoundland with a friend of mine, Ralph. Our reason for taking this camping trip in July 1984 was to photograph some of the marine birds on Baccalieu island, about 4 km east of Bay de Verde. We had organized a boat with the local fisherman to take us to the island and to pick us up four days later. I had brought along my Icom 2AT handheld and the vertical whip for possible use on the island. On our way up the peninsula to Bay de Verde, I had contacted "George" in Hearts Content on 2m and we had decided to maintain an evening sked while on the island.

This antenna . . . will be very effective, for those hams who have limited space . . .

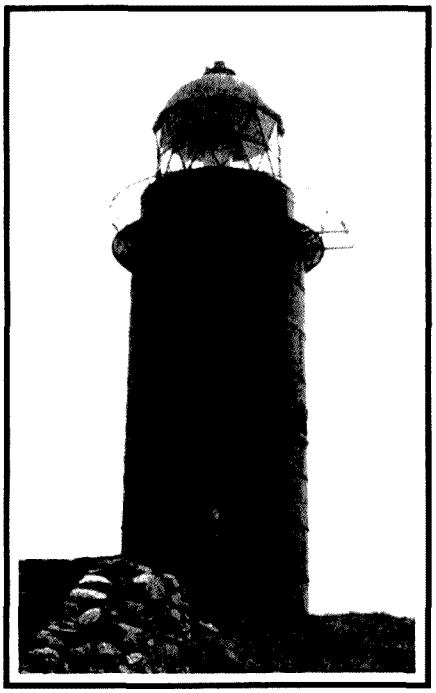
The island was uninhabited except for a manned lighthouse on the southern point, which was not easily accessible *from where* we camped. During the three days we had maintained contact with "George" every evening. On the fourth day, we were ready to be picked up by the fishermen. However, they never came during the morning or afternoon and it was getting dark. I contacted "George" in Hearts Content, via the St.Johns repeater, about 70 km SSE of us. At the same time, in the dark, the wind blew and the rain came down, with my friend Ralph holding up the antenna in his hands high enough so that we could hit the repeater.

I asked "George" to call one of the fishermen and ask when they would pick us up and then to get back to me. I found out that the fishermen had icebergs around their nets and had spent the day waiting for them to drift away, so that they could collect the nets. Finally, the next morning around 10 a.m., they arrived at the base of the cliff where they had dropped us off and we travelled back to the mainland — after they detoured to bring in the nets full of cod. Having the antenna this time really gave us comfort as we had no other way of contacting the mainland.

In 1986, I moved to Brisbane, Queensland and was anxious to find a job. In the meantime, I set up my equipment and proceeded to tune it up and to convert to 240 volts. The same antenna was mounted on the eaves in the back yard, about two metres off the ground with the counterpoise underneath it. I wasn't too optimistic, as the antenna was now facing the down side of a hill, with houses all round the area.

My first contact during the winter of 1986 was W6DQL in California on 20

Baccalieu Island expedition team at campsite.



Abandoned lighthouse at the northern tip of Baecalieu Island.

metres SSB! My signal was 57 while his was 54. This was very impressive for 60 watts at the time. I continued to have QSOs with stations from USSR to Japan, all through the USA and South Pacific. Most of these contacts were on 20 CW. One contact, on 17th April 1988, was with a station from my home QTH in Long Island, New York. This station, KC2FD was initially contacted on 20 CW, but we QSYd to 20m SSB, with reports of 57 in Brisbane and mine 56 in New York. I sent a message to my parents and my wife could not believe how clear the signal was at the time. I have since moved to Townsville and am still using this little antenna and it continues to perform very well.

Tuning and Construction Details

The counterpoise is approximately 10.66m long fully extended. The insulated wire (18 gauge) is coiled around the hand so that the remaining wire length is as follows for the following bands:

40m : 1006cm
20m : 444cm
15m : 290cm
10m : 112cm

These lengths are approximate to obtain an SWR of 1:1. For operation indoors, the counterpoise should be laid on the floor at a right angle to the antenna. In rooms above ground, an improvement in operation may be noted by hanging the counterpoise as close to the wall as possible. I have used wooden clothes pegs to hold coil shapes and move the counterpoise coil around, or coil or uncoil the remainder to get better results. An SWR meter is clearly of assistance. An antenna tuner can also be used once the counterpoise coil is close to its band length. The alligator clip on the end of the counterpoise wire is connected to the aluminium antenna mounting bracket which is attached to a non-metallic object (ie window sill, eaves, etc), or it could be insulated with cardboard, rubber etc.

The antenna whip lengths are as follows:

40 m : Full length (144.8cm) — Attach 40m coil.
20 m : Full length (144.8cm) — Attach 20m coil.
15 m : Full length (144.8cm) — Attach 15m coil.
10 m : Full length (144.8cm) — Attach 10m coil.

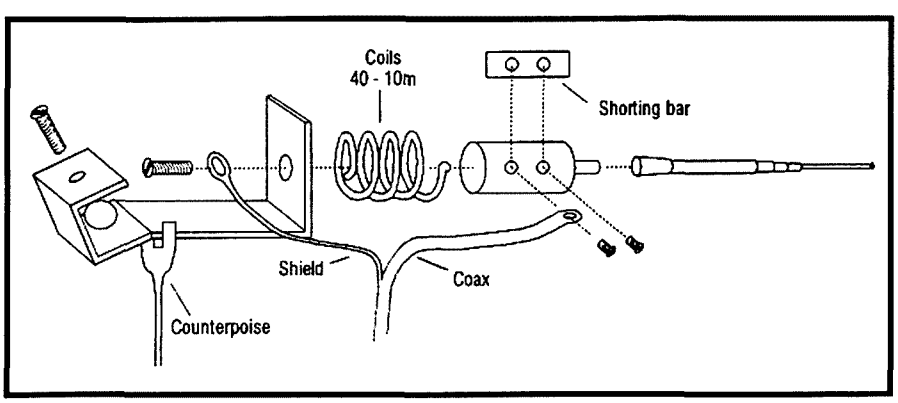


Figure 1 — Antenna Assembly.

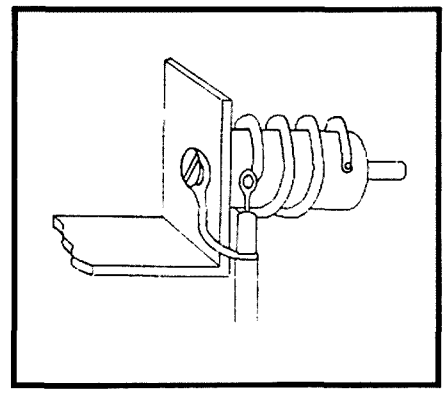


Figure 2 — Coaxial Connections.

6 m : Remove counterpoise and attach aluminium shorting strap. Whip is at 137.2cm. Do not ground window bracket.

The coils used are as follows:

40m : 22-24 gauge, 26mm long, 32mm diameter, 32 turns.
20m : 18 gauge, 30mm long, 32 mm diameter, 18 turns.
15m : 16 gauge, 32mm long, 32mm diameter, 11 turns.
10m : 14 gauge, 30mm long, 32mm diameter, 9 turns.

For mounting details of the coils and general construction details see Figures 1 and 2.

The cable used is RG58A/U. On the higher bands it appears that you do not have to readjust the counterpoise significantly when tuning up and down the band (ie CW band). Whereas you probably will have to if you change from the CW band and then operate in the phone band. The SWR may still remain below 2:1. On 40m, (which I have not operated on very frequently) you may have to retune within the CW and phone bands to keep the SWR below 2:1. This sort of antenna could easily be constructed from scratch and will be very effective for those hams or SWL's who have limited space to erect an antenna. As can be seen from the diagram it gives hope to some people that they can still enjoy ham radio without the space problems of large antenna systems.

Further information can be obtained by writing to the author if required.

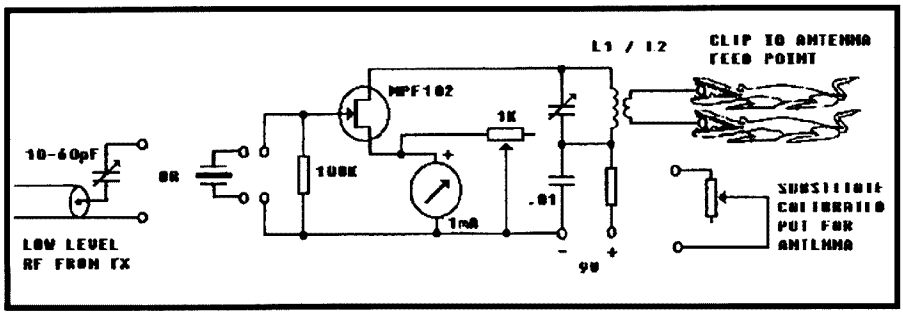
Good Luck!

* *PO Box 7951, Garbutt Qld 4814*

ar

Antenna Impedance Measurement by Substitution

Neville Chivers VK2YO 51 Meeks Crescent Faulconbridge NSW 2776.



After an antenna is erected and resonated to its desired frequency, it is necessary to know what the feed point Radiation Resistance is to correctly match the transmission line to the antenna, directly if they match, or by an Impedance Matching Transformer of suitable ratio if they do not.

This device when clipped across the antenna feed point will measure indirectly at the operating frequency the Radiation Resistance of the antenna where the transmission line is to be connected in-situ.

The oscillator is excited by a crystal or low level RF from a transmitter as shown, and brought to resonance by varying the C1/L1 tuned circuit in the drain of the MPF102 FET. L1/L2 is built as a plug-in unit, to cover the range of crystals or their harmonics that you wish to use, and the antenna to be measured.

The meter measures the source current of the FET and shows a pronounced dip when C1/L1 is adjusted to resonance. Once adjusted, clip the crocodile clips extended from L2 across the antenna feed point, and note the meter reading.

Remove the instrument from the antenna and substitute a non inductive variable resistor between the crocodile clips. A 300 ohm pot will cover helical whips to folded dipoles.

Adjust the variable resistor until the meter shows the same value as it did when the device was connected across the antenna feed point.

The variable resistor will be the same value then, as the antenna feed point Radiation Resistance and if previously calibrated the antenna impedance can be directly read in ohms from the substituted variable resistor scale.

By careful observation of the current variations in meter readings, any lumped constant can be checked for input impedance if it can be resonated at the input crystal frequency, or one of its harmonics. Provided it is physically possible to connect the device into circuit and within the operating frequency range of the FET.

The imaginative amateur can no doubt think of other uses for this instrument. I personally have tried it as a BFO using a ceramic filter as the exciting element and a miniature IF transformer in place of C1/L1, also as a crystal activity checker and marker oscillator to name a few.

Reference Reading — ARRL Antenna Handbook, 15th Edition, Chapter 2, page four, "Antenna Impedance". **ar**

WIA News

Powerline Interference Under Scrutiny

Powerline interference limits are being scrutinised in a revision of the Australian Standard prescribing the limits of electromagnetic interference (EMI) from overhead transmission lines, which provide protection for radiocommunications services.

The scope of the revision to AS 2344-1980 will change, the frequency coverage being lowered from an upper limit of 1000 MHz, down to 30 MHz. A separate standard will now cover the 30-1000 MHz range.

Another change involves cross-referencing the methods of interference measurements.

Standards Australia's intention is to publish this revision as a joint Australian/New Zealand standard. Its release will complete the publication of all EMI standards in this area as joint standards, according to Standards Australia.

1993 Remembrance Day Contest — Opening Address

This year's Remembrance Day Contest opening address was prepared by the Federal President, Kevin Olds VK1OK, and read by Bill Roper VK3BR. The Honour Roll was read by Warren Moulton VK3LX.

The Address

"Fellow radio amateurs. It is with great pleasure that I present, on behalf of the Wireless Institute of Australia Federal President, Kevin Olds VK1OK, this opening address to the 1993 Remembrance Day Contest.

I am very pleased to have this opportunity to speak to you on this opening of the 1993 Remembrance Day Contest.

We are surrounded by a world of change in our hobby, both at the government, Federal and Divisional levels as well as in the technical aspects of amateur radio.

We have recently seen the introduction of the Spectrum Management Agency, replacing the Department of Transport and Communications as the government body responsible for the regulation of our hobby. This provides us with challenges, as well as opportunities, as the new authority finds its feet and begins to put into place the mechanisms which will govern our hobby in the coming years. As the SMA is a new authority, we have the chance to get in at ground level, establishing contacts with this administration and forging ties which will be of long term benefit to amateur radio.

At the Federal and Divisional levels of the WIA things always seem to be in a state of flux. Federally we are undergoing a re-staffing in the Federal Office following the resignation of the General Manager and Secretary. This has necessitated a number of changes in the running of the Office and other Federal activities which we hope will prove invisible to the amateur population at large.

The technical side of our hobby has never stood still. From early beginnings with Morse code, we have progressed through AM and SSB to the likes of FM, RTTY, Amtor, Packet and ATV, to mention a few. The list of areas of activity of the modern radio amateur is ever increasing. New frontiers continue to confront us — witness the emergence of moonbounce, satellite operation, packet operation and the use of computers. How long before spread spectrum, FMTV, enhanced digital modes and other emerging technologies become a routine part of the Amateur scene?

At this time of remembrance we should also remember those who continue to give freely of their time and skills as amateurs for the good of the community.

Despite this world of change a few things remain constant, such as the way in which amateurs unselfishly establish efficient and effective communications networks in times of local and international emergencies. At this time of remembrance we should also remember those who continue to give freely of their time and skills as amateurs for the good of the community.

Another constant in our amateur lives in Australia is the RD Contest which has established itself within the Australian Amateur scene as the one contest many of us compete in each year, whether we are normally contesters or not. It is the time when we remember those amateurs who have given their lives in service to their country as we engage in this "the friendly contest". To those we remember today, the change which surrounds us would be unimaginable. In the same way, the things they did would have been unimaginable to those who founded our organisation way back in 1910. We are all pioneers in our own way, continuing to progress ourselves, our community and country to the ultimate benefit of all. We should have pride in what we do and remember with pride those whose sacrifice enables us to enjoy our hobby today.

And now the Remembrance Day Honour Roll."

Honour Roll

"We pay tribute to these members of the Wireless Institute of Australia who paid the supreme sacrifice.

Royal Australian Navy	
J. E. Mann	VK3IE
A. H. G. Rippin	VK6GR
Australian Military Forces	
C. D. Roberts	VK2JV
J. D. Morris	VK3DQ
J. McCandlish	VK3HN
S. W. Jones	VK3SF
D. A. Laws	VK4DR
J. G. Phillips	VK5BW
K. S. Anderson	VK6KS
Royal Australian Air Force	
F. W. S. Easton	VK2BQ
V. J. E. Jarvis	VK2VJ
W. Abbott	VK2YK
G. C. Curle	VK2AJB
T. Stephens	VK3GO
M. D. Orr	VK3OR
J. F. Colthrop	VK3PL
J. A. Burrage	VK3UW
J. E. Snadden	VK3VE
F. J. Starr	VK4FS
R. Allen	VK4PR
C. A. Ives	VK5AF
B. James	VK5BL
J. E. Goddard	VK6JG
P. P. Paterson	VK6PP
and	
Merchant Marine	
N. E. Gunter	VK3NG
R. P. Veall	VK3PV

They shall grow not old as we that are left grow old.

Age shall not weary them nor the years condemn.

At the going down of the sun, and in the morning,
We will remember them..."

Opening

"It is therefore with much pleasure that, on behalf of the Federal Council of the WIA, I declare the 1993 Remembrance Day Contest open.

Good luck in the Contest."

ar

Technical Correspondence

Lindsay Lawless VK3ANJ PO Box 112 Lakes Entrance 3909

G5RV Antenna

The G5RV is a popular recipe for a centre fed aerial but, how many are true to type?

The best available theoretical analysis of the G5RV is the paper by our own master engineer VK1DK published in the January 1989 issue of "AR". That paper shows that the G5RV is a mediocre, compromise broadband aerial. If a particular installation does not behave according to theory, I suggest it is worse than mediocre.

The design depends on a "matching section" behaving as a balanced feeder with properties predictable by transmission line theory. If the system, matching section plus aerial, is unbalanced, the behaviour is unpredictable and no amount of tinkering with "choke baluns", "candlebra baluns" or any other misnamed multi-inductor will restore balance.

Most backyard G5RV aerials will be unbalanced for reasons given in the text books. An inverted "V" version will be unbalanced wherever it is located. If your pride and joy is getting results it might not be because it is behaving as a G5RV should.

If the system, matching section plus aerial, is unbalanced, the behaviour is unpredictable and no amount of tinkering with "choke baluns", "candlebra baluns" or any other misnamed multi-inductor will restore balance.

The current at any point on a balanced feeder conductor is equal in magnitude and opposite in phase to the current at the corresponding point on the other conductor. It follows that the voltages with respect to earth at corresponding points are also equal and opposite in phase. Similarly, the currents and voltages with regard to earth on corresponding points on the aerial conductors are also equal and opposite in phase.

Balance can and should be checked before pronouncing a G5RV recipe true to type. Current magnitudes can be measured with a current sensor similar to the toroids used in SWR meters. (An interesting but rather complex sensor is described by G5HMO in the June and July '92 issues of "Radio Communication".)

Check that current maxima or minima occur at corresponding points on the matching section conductors. It is not necessary to check phase. The measurements must be made with the whole installation in its final operating position.

Don VK1DK, in his January '89 article, suggests there might be a better length for the matching section (and aerial?). Apparently others have investigated that possibility and some results are published in "Radio Communication — Technical Topics" of January '93. Also in that "TT" is a report about experiments with "choke baluns" similar to the VK6BIL version report in December '92 "Random Radiators". From my knowledge of first principles, I can't support some of the claims made for those devices.

ar

Technical Abstracts

Gill Sones VK3AUI

Dual Band Mobile Roundup

Only a large organisation like the ARRL can afford to buy six different mobile dual band transceivers to conduct a comparative review. Indeed, all reviews in QST, the ARRL journal, are of equipment purchased over the counter. The models in this review are similar to those available in Australia.

The review appeared in QST for June 1993 and was conducted by James W Healy NJ2L, who is the QST Senior Assistant Technical Editor. A panel of reviewers assessed the performance of the radios.

The technical measurements make interesting reading. The radios all met their specifications. Some measurements were, however, of parameters not specified.

A previous "Handheld Roundup" from the October 1992 issue of QST was summarised in the April 1993 edition of Amateur Radio magazine on page 15. The results make interesting comparisons. The handhelds were fairly close in performance to the mobiles.

The figures are shown in table 1.

The sensitivity of the receivers is given in dBm and the impedance is 50 Ω. This is used in preference to the input voltage in microvolts and is quoted for 12 dB SINAD. This allows a more meaningful comparison once you have adjusted to the nomenclature.

The interesting thing is that the receiver sensitivities are in the same range as the handhelds, whilst the intermodulation performance is only a little better in most cases. Small wonder that so many operators experience disturbance from adjacent services.

The current drain is much higher than the handhelds and the current must be used to run the displays and the processor rather than provide superior receiver performance. A high level mixer and a clean high level of oscillator injection would improve receiver intermodulation performance considerably.

The HF transceiver has been considerably improved and the VHF/UHF transceiver is sorely in need of improvement. The techniques used are available at VHF and UHF and the improved strong signal performance is sorely needed.

The transmit to receive turnaround time is of interest for packet operation. However, the prime thing is to be receiving or transmitting intelligible packets which is different to full audio or RF. The figure given, however, does give an indication.

The transmitter power levels reflect the use of power output modules.

Valves Versus Solid State

An interesting comparison of valve and solid state designs and performance at VHF was published in June 1993 issue of the ARRL magazine, QST, by Ulrich L Rohde KA2WEU/DJ2LR/HB9AWE. The performance of a number of valve and solid state designs was studied both by CAD techniques and by measurement. Both the actual measured results and the CAD results were in close agreement.

The valve equipment assessed was a 6CW4 nuvistor converter manufactured by Ameco and a 417A valve converter design widely used in the USA. These designs were typical of good quality 1960's era equipment used in the USA on 144 MHz and also on 220 MHz. The 6CW4 was available in Australia but the 417A was not so readily available in Australia. Local converters used TV dual triodes.

The solid state designs considered all used a high level double balanced mixer. The RF amplifiers considered used a bipolar cascode or a Dual Gate MOSFET and finally a GaAsFET to give a comparison of the various devices. The oscillator injection was +20 dBm which is quite high being 100 mW and the oscillator signal must be clean.

Given a good filter even the bipolar design would be superior to many of

Table 1

Radio		DR600T ALINCO	IC2410H ICOM	IC3230IA ICOM	TM732A KENWOOD	C5608DA STANDARD	FT5100 YAESU
Sensitivity dBm for	144 MHz	-123	-124	-125	-125	-123	-123
12 dB SINAD	432 MHz	-125	-123	-124	-124	-123	-123
Two Tone 3rd Order IMD	144 MHz	67	66	68	71	66	66
Dynamic Range 20 kHz Offset dB	432 MHz	68	71	69	65	60	75
Adjacent Channel Rejection dB	144 MHz	71	66	69	71	74	62
20kHz Offset	432 MHz	75	69	71	65	66	70
Tx Output Power	144 MHz						
Watts	High	43	49	47	48	48	50
	Med	10	13	11	12	11	-
	Low	5.4	6	5	6	4	5.7
	432mHz						
	High	32.3	39	35	35	42	33.9
	Med	9.5	13	11	11	11	-
	Low	5.4	8	6	7	4	5.4
Tx/Rx Turnaround Time ms	Mute On	110	175	195 -210	111 -130	200	110
	Mute Off	110	97 -110	140 -210	105 -140	200 -225	110
Tx Current Amps		7.85	9.8	9.0	9.1	11	8.4
Rx Current Amps		0.8	1.1	1.1	0.83	1.1	0.84

Table 2

Converter	AMECO 6CW4	417A	Bipolar Cascode	MOSFET	GaAsFET
Noise Figure	4 dB	1.6 dB	0.8 dB	0.7 dB	0.4 dB
Third Order Input Intercept Point	0 dBm	+5 dBm	+7 dBm	+10 dBm	+10 dBm

Gain in all cases was around 20 dB

the radios we use which suffer from disturbance by adjacent services.

The measured performance of all designs is summarised in Table 2.

Transmitter Finger Printing

A small advertisement in the June 1993 issue of QST advertises a plug-in card and software for an IBM PC or compatible which records the variation in frequency of a received signal as the signal comes on air. A fairly simple procedure of recording the discriminator output of a receiver as a signal is received. During the first 100 mS or so of transmission the frequency transmitted varies as the transmitter starts up.

This technique of looking at the startup of a transmitter is not new but a computer based setup does have some possible uses. By building up a library of various transmissions it would be possible to correlate and possibly identify particular transmitters.

If you listen to the beat note of an FM radio coming on the air you will hear the varying beat as the transmitter comes on frequency. This characteristic varies from transmitter to transmitter and may be used to identify transmissions.

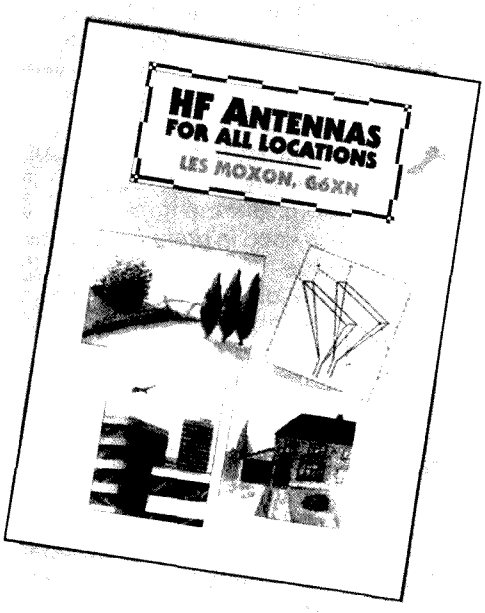
The PC Plug In and software are marketed by a company called MoTron Electronics.

The concept does offer some interesting possibilities for repeater operators and others. Even if absolute identification was impossible the technique would allow the categorisation of signals and allow a more focussed response to problems.

ar

Book Review
HF Antennas For All Locations

By Les Moxon G6XN
Reviewed by Ron Fisher VK3OM



Over the years, I have read dozens of antenna books and read hundreds of antenna articles. But it's rare to meet an author on the air and actually hear how he puts his theory into practice. The exception is Les Moxon G6XN. Les can often be found on 20 metres testing out a new idea usually with spectacular success. Some years ago he moved from his spacious country property to more confined quarters but he still puts out a good signal, usually not too far behind the best.

The first edition of *HF Antennas For All Locations* was published back in 1982 and has been a good seller over that time. My own copy has been well thumbed through.

This second edition has been brought up to date and expanded to bring new antenna types and ideas to the attention of antenna experimenters. The book is divided into two parts. One, "How antennas work" and two, "Theory into practice". One completely new chapter describes "Small Antennas". Loop and loaded antennas are described plus a discussion on the amount of loss that might be expected from such designs.

For G5RV enthusiasts there is a lot of data on the various feed methods but strangely, baluns don't rate a mention for use with this antenna.

I also find it strange that Les gives little information on antenna couplers. The "Z" Match in any form is also not mentioned.

None the less, if you are a wire antenna builder then this book is for you. If you believe that good antennas should be made from aluminium tubing then some of the designs included might make you change your mind.

In concluding, I must compliment Les Moxon on his continuing enthusiasm for amateur radio and antennas in particular. He is now well into his eighties. I hope I am still playing with antennas at his age.

Do yourself a favour, buy a copy of the new edition of *HF Antennas For All Locations,* I can guarantee the antennas work. I've heard most of them on air.

Our copy came direct from the publisher, the Radio Society of Great Britain, but copies are available from Divisional bookshops at the retail price of $45.00.

ar

A Low Noise Pre-Amp for the ICOM IC-275A/H

Albert (Bert) Gnaccarini VK3TU provides an absorbing modification to a popular transceiver.

The market for two metre multimode transceivers is highly competitive with all three commonly available Japanese manufacturers offering equipment of largely similar performance, give or take a few watts at the antenna terminal.

What seems to separate the equipment into the more and less desirable categories appears to be the features such as number of memories available, general coverage receive frequencies, power output, multi-band capability, whether the equipment will suit fast packet data transmission or not, price and the personal preference of the buyer.

Particular attention seems to be paid to the bells and whistles and not the fundamentals such as receiver sensitivity, front end design or strong signal performance.

When I chose to update my Yaesu FT-221R I opted for an Icom IC-275H, considering it to be the best value for money package at the time, a view I still maintain today.

With my main interest in two metres being weak signal SSB contacts, I was disappointed to find that the receiver sensitivity of the new rig was little or no better than that of my FT-221R. Admittedly, the old Yaesu had a modified front end using a low noise MOSFET, but my expectation was that the performance of the Icom, some 15 years its junior, would be somewhat better. After all, it used a GaAsFET front end and radios must have improved in the interim — or so I thought.

The fact was that as a multimode radio goes, the IC-275H was a pretty clever FM rig and that's all! Careful measurement of the Minimum Discernible Signal (MDS) confirmed my suspicions of the Icom with a figure of -137 dBm. As a rough indication, this translated to a Noise Figure of around 4 dB. So what had happened to the benefits of GaAsFETS?

A carefully built MOSFET pre-amp using the inexpensive BF-981 would easily return a noise figure of 0.7 dB and a GaAsFET should return around 0.4 dB, so my new rig was well and truly behind the eight-ball on those weak signals. Conversations with a couple of other amateurs using the IC-275A/H as well substantiated my opinion.

Options

I was faced with a number of options; build a mast head pre-amp using either a GaAsFET or MOSFET, buy a suitable masthead pre-amp or build a pre-amp into the rig. I chose the final option for a number of reasons. Firstly, as the rig is likely to be used in a portable situation, it's nice to be able to take the pre-amp with you, particularly to quiet environments where its benefits can be exploited. Secondly, as cable loss in my antenna installation at home is around 1 dB, a front end Noise Figure of less than 1 dB would mean that in a suburban environment, the system would still be externally noise limited.

Building the pre-amp into the transceiver required no special care in waterproofing the unit and finally, it was the least expensive option as all that I required was already in my junkbox.

The Circuit

The device I used in the pre-amp was a BF-981 dual gate MOSFET. At a little over a dollar each, these transistors are excellent value for money. The circuit employed in figure 1 is an adaptation of one published in June 1984 AR by Gordon VK2ZAB and has been used extensively as masthead amplifiers with a great deal of success by my brother, Charlie VK3BRZ as well as others. He has built several of these and has reliably achieved measured noise figures of less than 1 dB. (typically around 0.7 dB). The circuit follows the traditional common source layout as is typical for this type of transistor.

There is little to say about the circuit except that care must be taken with construction paying particular attention to shielding, ground plane connections and minimising losses in the input circuit.

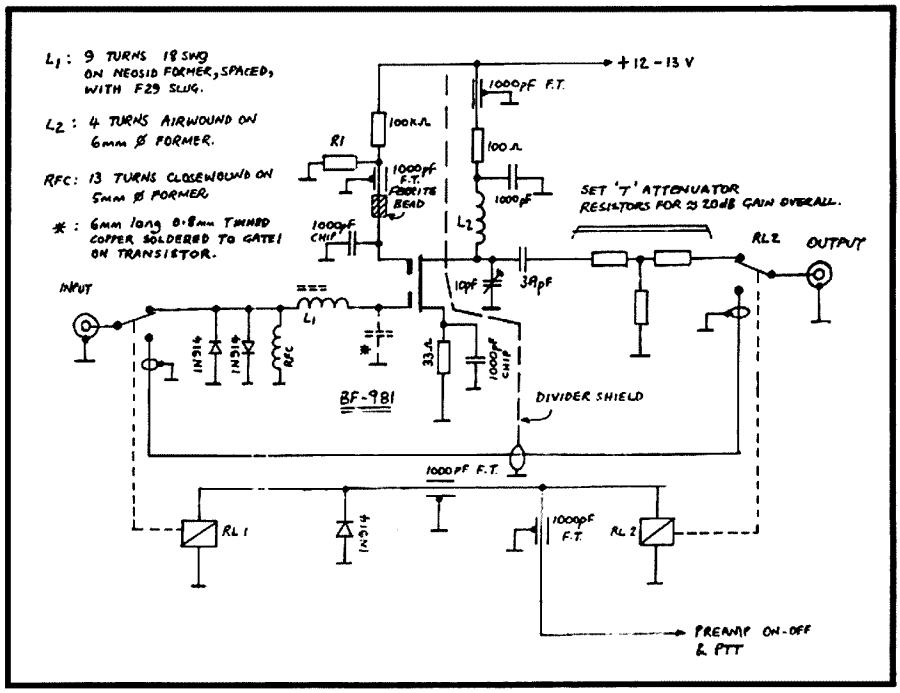


Figure 1 — Overall circuit of the pre-amp. Interfacing with the pre-amp ON-OFF and PTT is not shown, but is easy to arrange.

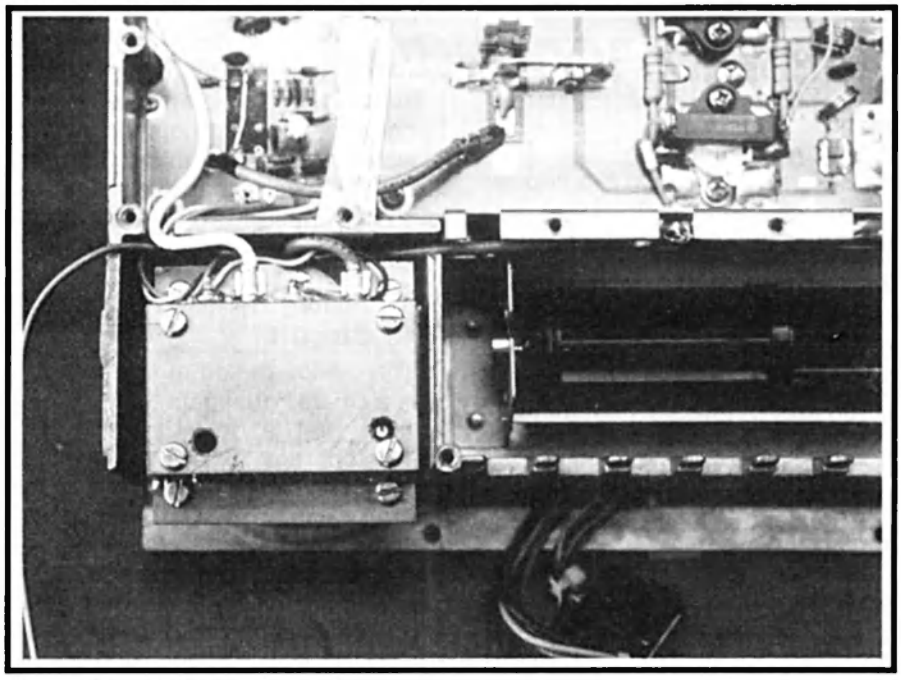


Figure 2a — Refer to the text.

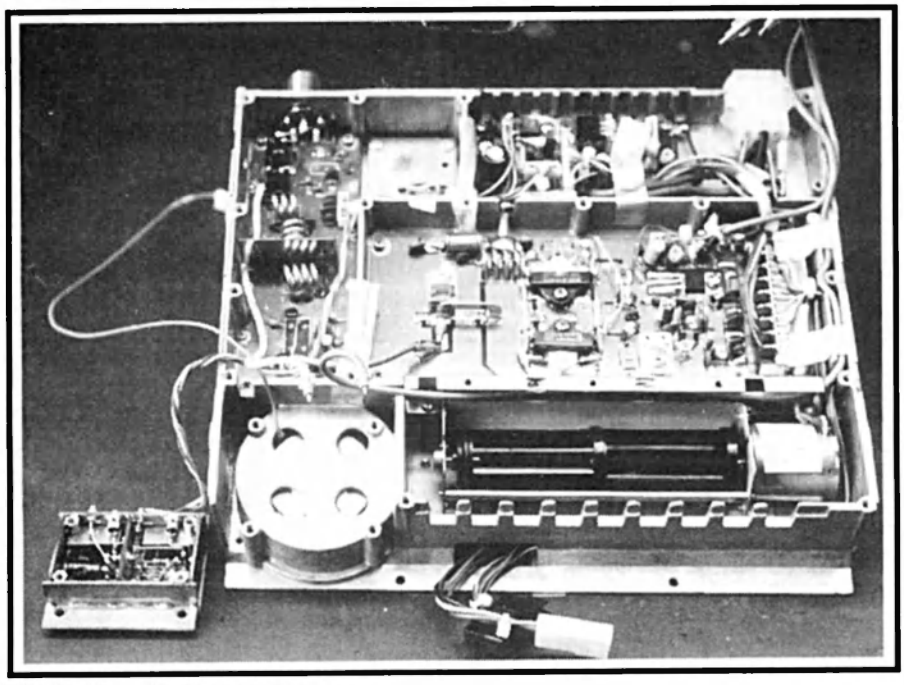


Figure 2b — Refer to the text.

Construction

The pre-amp is enclosed in a small box made of double sided PCB. This is easy to make and, as can be seen from figure 2(a) and figure 2(b), is easy to mount on the underside of the loudspeaker mount on the heatsink of the IC-275H. The signal switching relays for when the pre-amp is not required are also mounted in the case. Most of the switching for this function is included in the IC-275H as the transceiver has provisions to use a masthead pre-amp employing DC feed up the antenna coax. Some interfacing to this circuitry is required, however I have left this out as it is not relevant to the topic of discussion and is quite simple to arrange.

Construction is of the "rats-nest" variety often referred to as "dead-bug" construction in American publications.

The input circuit compartment must be fully shielded from the output and includes an input switching relay. This can readily be achieved as shown in figure 3 by including a divider made of double sided PCB in the case. The BF-981 is mounted by its gate 2 and source leads directly to two "lands" etched onto the divider with its drain lead protruding through a 5 mm hole into the output compartment.

The ground plane of the divider must be strapped from input to output sides using brass or copper shim to ensure a low impedance ground in the vicinity of the transistor. Along with the BF-981 are mounted the source resistor and bypass capacitor as well as the gate 2 bypass capacitor. The pre-amp signal switching relays are connected using a small length of UT-141 coax which is soldered to the case and divider as these are assembled. Also, the input tuning capacitor value must be kept to a minimum, in most cases a 6mm length of 0.8mm tinned copper wire soldered directly to the gate 1 lead of the BF-981 will suffice as a variable capacitor.

It must be stressed that lead lengths and stray capacitances will significantly affect the performance of the pre-amp and care must be taken to reduce these factors. Keeping things small also assists in maintaining rigidity which contributes to overall stability. I fitted coax connectors to the input and output of the pre-amp only as a means of removing it from circuit during evaluation, however there is no reason why the connection can't be made using coax links.

The output compartment houses the output tuned circuit and drain supply circuitry which includes a 100 ohm resistor as part of the DC decoupling. This also facilitates setting the DC conditions for the BF-981. This compartment also houses an output switching relay and an output attenuator to set the insertion gain to around 15 to 20 dB. In practice, I found that the overall gain of BF-981 transistors varies significantly and the output attenuator needs to be set for each individual transistor. The ARRL handbook has

details of preferred value resistor 50 ohm "T" attenuators.

All DC connections into the case and across the divider are made via 1000 pF feedthrough capacitors.

Preamp Control

The preamplifier switching on the IC-275H provides nominal +12 volt line when the preamp is switched on. This line disappears to zero volts under three conditions; when the transmitter is enabled, when the radio is switched to DATA mode, and of course when the preamp is switched off. This being the case this line is adequate to control the relay state of the preamplifier.

The circuit of figure 1 shows the relays when the preamp is in the ON mode and it is in circuit. The relays used are reed types and are energised when the preamp is removed from circuit. To achieve this a simple DC logic state inversion is required for the control voltage for the relays. This was provided by a pair of silicon transistors which are not shown in the circuit diagram.

The preamp control voltage was used as the DC supply to the preamp and as the preamp relay control via an inverter stage driving the relays.

Modifications to the Transceiver

Installing the pre-amp is quite easy as the signal lead from the RF filter board to the receiver front end is routed right past the location I chose for the pre-amp. There is plenty of space to include DC supply and switching leads for the device as well. Also, I removed the RFC supplying the switched DC to the antenna connector, L1 on figure 4(a) of the IC-275H as it is no longer required.

A further modification I included at the time of installation was to relocate the antenna switching relay on the RF filter board to immediately adjacent the antenna socket so that the input to the pre-amp did not include the losses associated with the filter and SWR protection stripline as seen in figure 4(b) and figure 5. A measurement before and after this step showed around 1 dB improvement in receiver MDS, and every bit helps when a front end Noise Figure of less than 1 dB is anticipated.

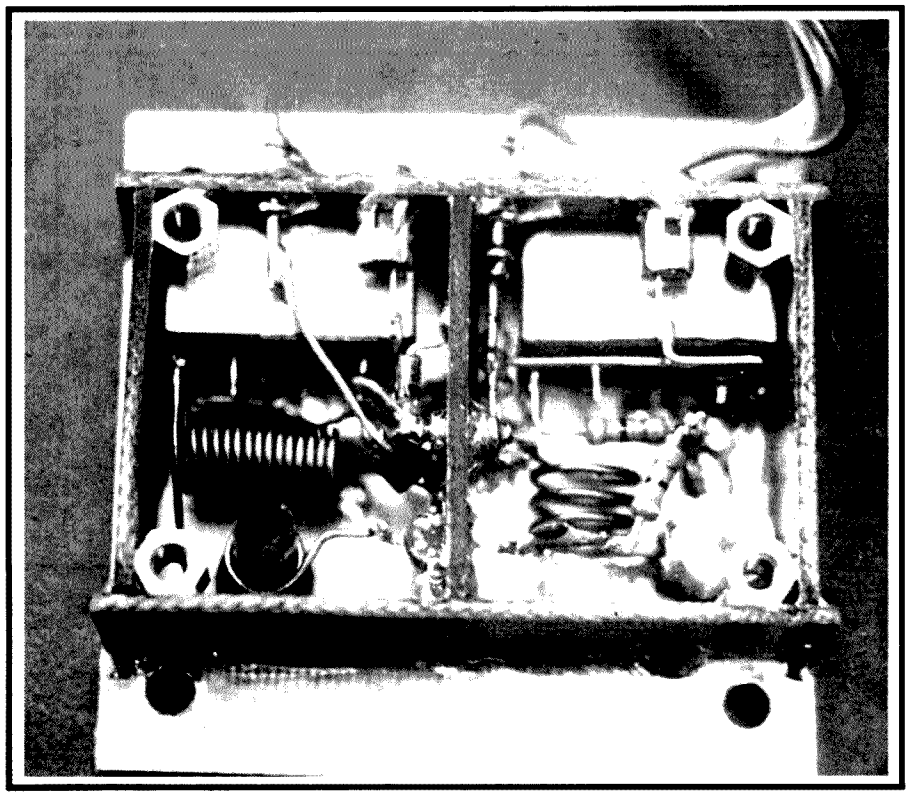


Figure 3 — Details of the pre-amp internals, showing the location of the major parts. Input compartment is on the left.

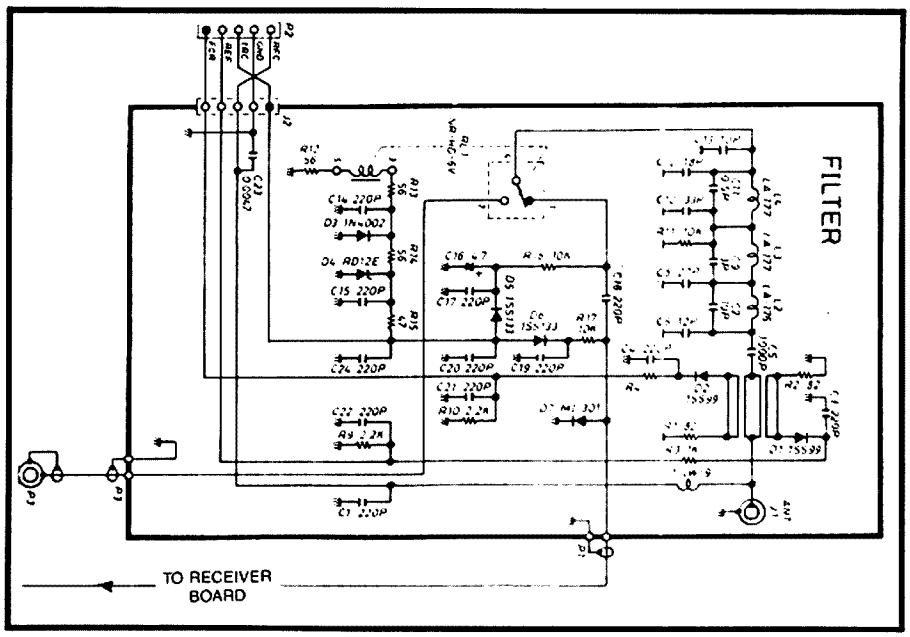


Figure 4a — The standard configuration for the IC275H output filter board, showing the convoluted and lossy receive signal path.

Setting Up and Tuning

The drain current for best noise figure for the BF-981 is in the order of 10 to 12 mA. This is set by adjusting the value of R1 while monitoring the voltage across R3. I found the most convenient approach was to set this up before installing the pre-amp in the transceiver. The method I used was to use a potentiometer to substitute for R1 and set the current to 11 mA. Remove the potentiometer, measure its value and substitute the nearest fixed value resistor.

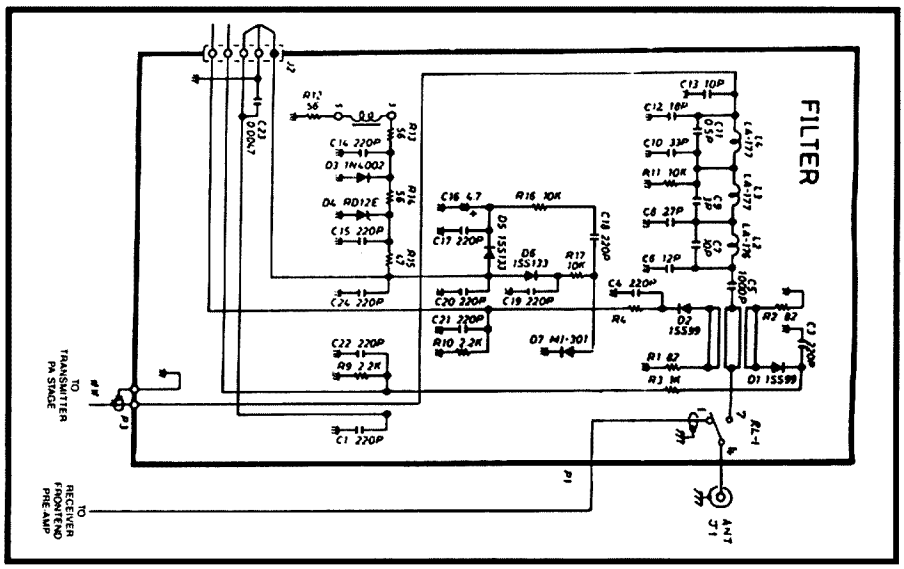


Figure 4b — The modified filter board showing how the relocated relay improves receiver signal path. The original relay used in the IC275H is identical to those used in the pre-amp.

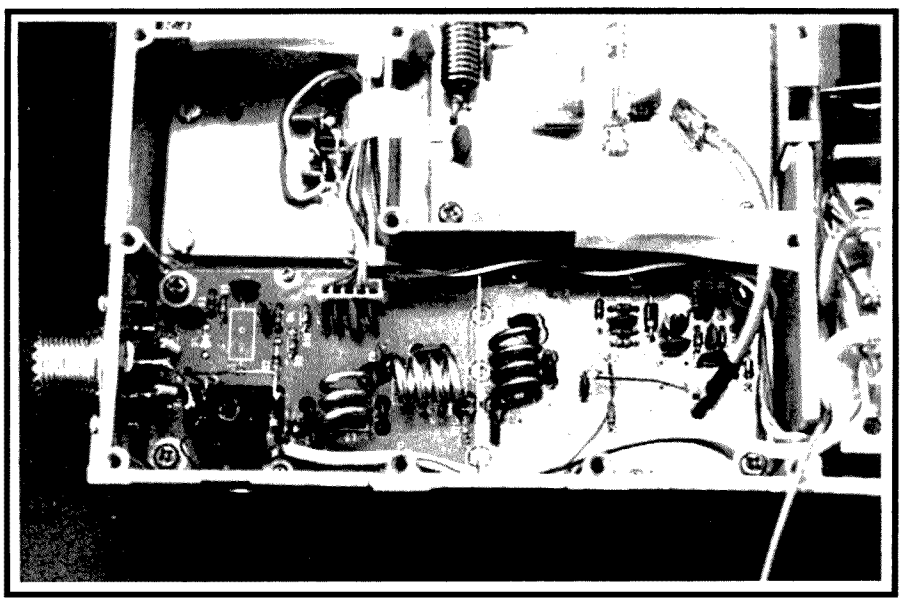


Figure 5 — Detail of modification to the IC275H RF filter board. Relocated relay is held to the PCB with super glue, and wired directly to the antenna socket.

Tuning the pre-amp requires a reliable weak signal source with an accurate 50 ohm source impedance. A weak signal is applied to the pre-amp and its input and output tuned circuits are simply peaked for maximum receiver audio on SSB or best receiver quieting on FM. This step should only be performed with the cover on the pre-amp case. I measured receiver audio on SSB with an accurate AC millivoltmeter calibrated in dB across the loudspeaker.

This also allows you to measure the gain of the pre-amp so you can select suitable resistors for setting the overall gain of the pre-amp. Take care not to apply too much signal as the AGC action of the receiver will tend to compress audio output. I found that the AGC starts to operate at very low signal levels on the IC-275H.

Conclusion

The pre-amp as shown in the photographs tuned correctly on the first attempt and showed no signs of instability. The insertion gain for the unit was set to a little under 20 dB. It should be pointed out that any more gain than this is likely to compromise the strong signal performance of the radio as it will detract from receiver dynamic range.

The inclusion of the pre-amp has made a significant improvement to receiver sensitivity. The receiver MDS after the installation of the pre-amp was measured as -140 dBm and represents an improvement of around 3 dB. This represents an approximate noise figure of around 0.9 dB.

A further benefit is that the noise blanker now operates on very weak ignition noise and power leak when the pre-amp is switched in. Previously, the noise blanker would not take out noise below S2 or S3 making it ineffective as a QRN countermeasure on weak signal DX contacts.

The end result is that the IC-275H no longer appears deaf and the bonus improvement in noise blanker performance makes it a nicer rig to use. The measured improvement in receiver performance alone is worth the effort of constructing the pre-amp.

ar

Amateur Radio at the 1993 Rotary International Convention

Norm Dench VK3DNE, a member of the Rotary Club of Keilor, tells how amateur radio was a success at the Melbourne Rotary International convention.

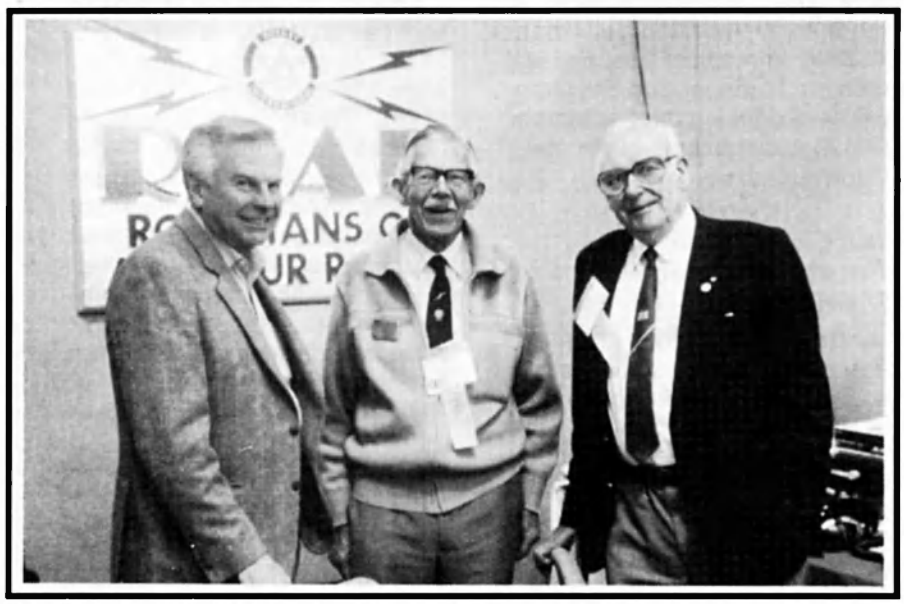
From May 23rd to the 26th, Melbourne was host to one of the largest gatherings of members of Rotary International ever to have visited an International Convention. There were more than 20,000 delegates from over 187 countries and geographical regions in attendance.

The Flinders Park Tennis Centre complex was the main venue for the Convention. Plenary sessions were conducted in the main auditorium which has a seating capacity for 10,000 people. The opening ceremony had to be held in two sessions to cope with the huge attendance. The indoor practice court area was transformed into a pleasant and comfortable "HOUSE OF FRIENDSHIP', an area where delegates could gather to meet with friends and acquaintances, and booths where the various International Fellowship Organisations of Rotary presented their activities. One of these International Fellowship Groups is ROAR, Rotarians Of Amateur Radio.

With the help of Dick Smith Electronics, who supplied an FT-990 HF transceiver, and Andy Coman Antennas who provided a multi-band vertical antenna, an Amateur Station was established on site in the House of Friendship with a special events call for the Convention, VI3ROR.

Over the three days of the

The sign at the amateur radio booth.



Enjoying an eyeball QSO — left to right VK3DNE, G2DWQ, G4HMG.

WIA News

OSCARs' Orbits to Get Crowded

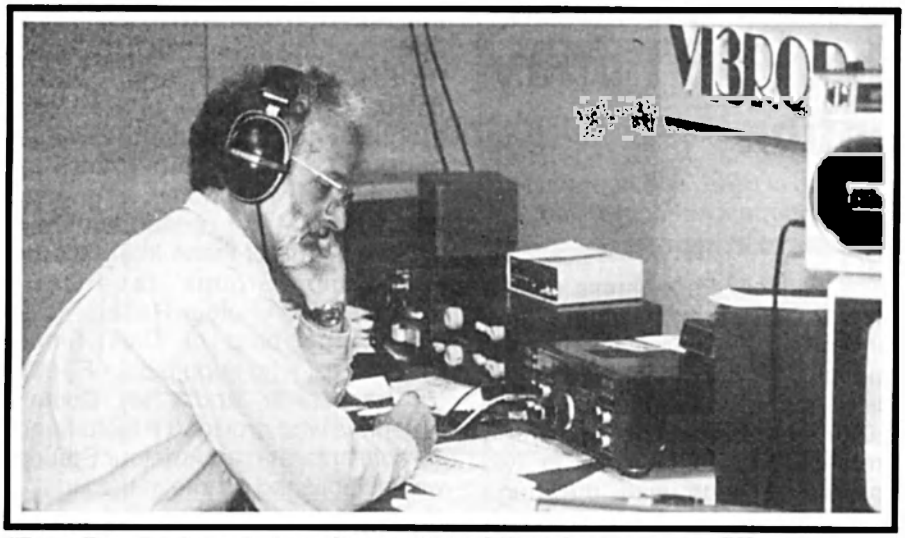
A world-wide mobile telephone service, which will work through a network of 66 satellites in low-earth orbit, has come closer to reality with the official launch last month of the company which is to manage the project.

Named Iridium Inc, after the satellite phone service's project name, United States communications company Motorola founded the company with equity from companies in Asia and Europe as well as the US.

The satellite mobile phone service is scheduled to begin operating in 1998. Call charges are predicted to be around three dollars US per minute (in today's values).

Equipment makers and corporations involved in Iridium are not concentrated solely in America, with German, Chinese and Russian companies taking part.

It's going to get awfully crowded up there in a few years. One hopes there'll be some room left for a few OSCAR satellites.!



"Pounding the Brass". John Swartz WA9AQN works some rare DX.

Convention, although the House Of Friendship was only accessible from 9 am till 5 pm, which severely limited the useful propagation hours, more than 150 contacts were made on SSB and CW with countries including Algeria, USA, Alaska, Russia, Germany, Slovakia, Poland, France, Spain, Japan, Philippines, Antarctic, Papua-New Guinea, New Zealand and, of course, VK. A special QSL card was struck for the occasion and has been sent to all stations worked, via the Bureau.

The station was manned by members of ROAR from VE, W, G, JA, ZK, VK and I. There were 79 licensed Amateurs from around the globe who signed the visitors book at the booth and the 42 members and guests who attended the Annual General Meeting Dinner enjoyed an inspirational address by Hugh Archer W8JA, a Past World President of Rotary International.

VI3ROR certainly provided a focus at the Convention where many long standing radio friendships were confirmed most enjoyably by an eyeball contact.

ar

WIA News

New Federal Secretary and Office Manager

A new Federal Secretary and a Federal Office Manager were appointed in late July, and commenced work in the first week of August.

Bruce Thorne is the new Federal Secretary, with responsibility for the efficient management of the business of the Federal WIA Board and Council.

Donna Reilly is the new Office Manager, responsible for running the Federal Office of the WIA, which handles membership, examinations and publications.

They were selected from a field of 20 candidates who replied to advertisements placed in June, which closed on 16 July, just before the July quarterly Federal Convention.

The Federal Board's re-staffing sub-committee spent a day and a half interviewing candidates over the 17th and 18th July, finally recommending these two people who were subsequently approved by the Board. Neither are radio amateurs.

We're sure all members will welcome them and give them every cooperation.

With the departure of Bruce Bathols, the position of Production Editor for Amateur Radio magazine was advertised in "The Australian" at the end of July. Until an appointment is made to this position, Bill Roper VK3BR, immediate past Federal General Manager and Secretary will be producing the September and October issues of Amateur Radio.

Amateur Station Statistics

Spectrum Management Authority (SMA) statistics on active station licenses to the 30th of June show that there were 18,242 amateur licenses issued to that date, an increase of only 20 in the three months from the 31st of March.

This indicates that amateur radio growth, which tapered off in the past year, remains sluggish, likely affected by an increasing rate of silent keys together with losses of those who give up an interest in the hobby and let their licence lapse.

However, the SMA statistics do indicate there were 16 licences pending at 30th June.

Overall, there were 10,685 Full licences on issue, an increase of 51 on March figures, while there were 3390 Limiteds, a decrease of 21. There were two fewer Novices as of June, compared to March, with 2631 licences issued, and Combined licences were down by seven, to 1531. It seems a few people upgraded!

Repeater licences were up by four, to 338 at the end of June, while beacon licences were down one, to 26.

Have you advised SMA of your new address

Luke Gow Follows Family Tradition

An extract of an article by Don Rannard VK2LDR which appeared in the Manning-Great Lakes "EXTRA"

Under the tutelage of his father, Rod Gow VK2NO, Luke Gow studied for his ham licence and is now VK2GXQ. This is his story as published in their local newspaper:-

Fourteen year old Luke Gow, who is a year nine student at St Clare's High School in Taree, lives with his parents Rod and Wendy on their property on Oxley Island.

Luke's family has a tradition in amateur radio. His grandfather being first licensed in 1938, while father Rod holds a full call licence.

A school assignment from St Claire's last year stimulated Luke to seek the help of his father Rod for more information.

"I remembered that dad had a transmitter stored away in the roof, so I asked him to get it down," Luke said.

"Dad and I set it up and he showed me how to talk to people all over Australia and the world by using the transmitter. I then decided to go for my own licence and after studying in my spare time during the Christmas holidays, I passed the exam in March and was granted the licence".

Since going "on air" Luke has spoken to people in ninety different countries around the world. These countries include Antarctica, the Galapagus Islands, Kenya, Macau and Europe.

On one occasion Luke spoke to an entire family in Kuwait who were also interested in amateur radio.

He has a large collection of cards and other small items sent from around the world by people to whom he has spoken on radio. Luke has also spoken via his radio to people in the United Nations Headquarters in America and to ordinary people in 44 of the 50 States of the US.

"I have spoken to a chap called Bob at the Johnson Space Centre in America and he has sent me a lot of interesting material on the US Space Satellite program," Luke added.

"Because I am talking first hand to the real people of this world, I have much better understanding and knowledge of their lives and lifestyles. Too often we only hear politicians or what the media wants to present," he said.

Luke feels that his involvement in amateur radio will help his career prospects as he wishes to study Science and become a teacher.

"Quite often I have my mates in to participate in radio activities and I would like to see more young people becoming "ham" radio operators", Luke said.

ar

Goldilox
A Grim(m) F-air-y Tale

*Rodney Champness VK3UG * tells how some pirates learnt their lesson.*

Once upon a time, about the Ides of March to be exact, two young gentlemen gathered at the abode of one of them, to place upon the air certain messages and signals which, under the laws of the land, they were not supposed to do.

They had been sending their signals for only a little while when there came a "knock, knock" at the front door. They wondered who it could be — no-one could possibly know they were not gentlemen at all, but pirates! Ah well, probably only a passing stranger wanting to ask his way.

So one of the pirates opened the door, and there indeed was a stranger, who introduced himself as Goldilox. Now the pirates had never met Goldilox, although they had heard about him and knew he lived at Ray-Deo Cottage, at least between 8 o'clock in the morning and 4 o'clock in the afternoon from Monday to Friday. What was he doing so far from home and at such a late hour?

The pirates soon found out. He wanted their message-sending machines. They also found out that Goldilox had a third arm. He usually kept it hidden, but showed it to them soon after they had let him in.

The pirates were very frightened indeed when they saw how Goldilox was armed — they knew quite a lot about the people at Ray-Deo Cottage, or at least they thought they did, and had made jokes about them. It was a different story now!

So they gave their message machines to Goldilox, and watched sadly as he placed them in his carriage drawn by 30 horses and drove off into the night.

Bright and early the next morning the pirates made their way to Ray-Deo Cottage, hoping that if they told

Goldilox they were sorry they had disobeyed the laws of the land, he might forgive them. Perhaps even let them have back their message machines if they promised to give up being pirates.

They asked if they could see Goldilox, and soon a very tall and handsome man came to them and said, "What can I do for you?" The pirates replied, "We would like to see Goldilox." "But," said the tall man, "I am Goldilox."

"You are not the Goldilox who called to see us last night and took away our message machines," said one of the pirates. Then the tall man said, "I think you had better come inside and tell me all about it."

And so the pirates told him all that had happened the night before, and said they would know the fake Goldilox if they saw him again. They might even know his voice if they happened to hear it.

The real Goldilox wrote all this down in a book he called his diary, and told the pirates to come back and see him again in a few days time.

Goldilox then went to see his friends at a place called the Moni-Toring Station where they have a very special message machine which keeps watch on all signals and records them in a very long and narrow book called "tape". For several days he was busy listening to voices, hoping to hear the one he thought would belong to the man who had tricked the pirates.

At long last, after many hours of hard work, he found it — the voice of the wicked Baron Horrid-Al, who was a really BIG pirate and had been for a long, long time. But the people at Ray-Deo Cottage knew all about him, although the baron did not know this and pretended to be a kind and honest man, especially to younger pirates.

So when the two young pirates went back to Ray-Deo Cottage they were able to listen to Baron Horrid-Al's voice and say, "Yes, that is the man who took our message machines."

Goldilox — the real Goldilox — then went to see some other friends, the Blue Bottle Men, whose job is to see that the laws of the land are obeyed, and although the young pirates themselves had been disobedient, what the wicket Baron Horrid-Al had done was far, far worse.

So Goldilox and the Blue Bottle Men went to the house where Baron Horrid-Al lived and took him away and locked him up. Later on he was sent to a place called Bluestone Castle, which is not really a castle, but a sort of college where people like Baron Horrid-Al are given lessons for a year or two years or perhaps even longer.

The two young pirates are also receiving lessons, and later on hope to buy new message machines and use them as gentlemen, as set out in the laws of the land.

As for Goldilox and his friends at Ray-Deo Cottage. Well, of course, they all lived happily ever after.

Editors' note: *Once upon a time, there was a Victorian Radio Inspector whose name was David Gold.*

* *17 Helms Court, Benalla Vic 3672*

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of July 1993.

L20946	MR R D KIDD
L20947	MR G H SCHULER
L20948	MR R E SHAMMAY
L20949	MR M F GROGAN
L20950	MR F HUNT
L20951	MR S KUMAGAI
L20952	MR V PINCZEWSKI
L20953	MR D M REED
L20955	MR J NOLAN
L30784	MR A LUCANI
L30856	MR W TANGEY
L30859	MR O THOMSON
L30860	MR L LATIMER
L30861	MR K GILBERT
L30862	MR R MILLARD
L40352	MR A K GUNN
L50303	MR F KISH
L60327	MR G LEA
L60329	MR I J GARNETT
VK1JS	MR J STEVENS
VK1MTX	MR A IHASZ
VK2ACW	MR J ROGERS
VK2BTS	MR A J SMITH
VK2DRP	MR D R PLUMB
VK2EJC	MR J R CAMERON
VK2FHC	MR E LAHODNY
VK2GOD	MR A W CLARKE
VK2GVA	MR J MORRIS
VK2GYH	MR B BRAITHWAITE
VK2JSB	MR S BATHIS
VK2KFS	MR K G FORBES-SMITH
VK2NMB	MR M B BRASSINGTON
VK2TCI	MR P COX
VK2YCV	MR A A CAMPBELL
VK3AXL	MR B J NEUMANN
VK3BFT	MR B TONIZZO
VK3CCA	MR T CHOY
VK3CD	MR A CAMPBELL-DRURY
VK3EE	MR E CALLEJA
VK3ETP	MR S D AITKEN
VK3EX	MR H PAKULA
VK3FMH	MR M HOOKE
VK3KR	MR P O'BRIEN
VK3TQT	MR J SOSNIN
VK3VTR	MR K J TRINDER
VK4AKD	MR H H BROWN
VK4AQJ	MR J C PENNY
VK4CCG	CHANEL COLLEGE
VK4DAS	MR D SMITH
VK4MIM	MR T M DICKSON
VK4TEK	MR J W HILL
VK5RTV	SA ATV GROUP
VK5UW	MR J F BOTHWELL
VK6AYK	MR J M COHOE
VK6DUN	MR M P DUNN
VK7MJB	MR J M BEATTIE
VK7NKR	MR K J RILEY
VK7OC	MR H OCHSNER
VK7PBC	MR B R CRUSE
VK7TTT	MR M RICHARDSON

Don't buy stolen equipment — check the serial number against the WIA stolen equipment register first.

Make Your Own Low-Loss Capacitors

*Graham Thornton VK3IY * revives a practical method of construction.*

Capacitors capable of handling high voltages and currents at RF are very hard to come by. In the early days of amateur radio (no, even further back than my time!) home-brewing of capacitors was commonplace. The time is nigh for a revival of this practice.

Advantage can be taken of the quite extraordinary dielectric properties possessed by polyethylene (polythene). Its breakdown voltage is 1000 volts per mil (ie per one thousandths of an inch). This amounts to a million volts per inch! Its dielectric loss at RF is very small. A capacitor with polythene dielectric will have a power factor of 0.0003; that is to say a Q of 3300. Put another way, of the product of the RMS values of voltage and current across and through the capacitor, only 0.0003 of it will be dissipated as heat. As a practical example, with 10kV and 1A (10kVA), only 3W of heat will be produced.

Fortunately, supplies of this excellent dielectric are readily available. Pure polyethylene sheeting can be obtained which is just one thousandth of an inch thick. It is called "GLAD Wrap" (1).

The capacitance of a parallel plate capacitor is:

C = 500A/n pF where A = area of one plate in square inches and n = the number of layers of GLAD Wrap. Or, for you young "fogeys" who prefer everything metric:

C = 77A/n pF where A = area of one plate in square centimetres.

The breakdown potential will be 1000n volts.

One catch about polythene is its low melting point. It softens at 104C. It is necessary to solder the connecting leads to the plates before assembly.

The GLAD Wrap should project beyond the dimensions of the plates, and be folded back over their edges. This will prevent the fringing field breaking down the air between the edges. Wrinkles and air bubbles should be avoided in the dielectric. The whole can be wrapped in GLAD Wrap (what better insulator?). The assembly should be clamped firmly to exclude air. For the desperate, this could be done with a plastic clothes peg, or bind it tightly with fishing line, or whatever. If a screwed clamping arrangement is used, this will produce a variable capacitor whose maximum capacitance will be as calculated above.

One intriguing possibility is to use copper coins as electrodes. (Well, after all, they won't buy much else, will they)? The inevitable air gaps caused by the embossings will give a lower capacitance than calculated.

Thin dielectrics are unlikely to cause a problem, but with thick ones, considering the low thermal conductivity of polythene, temperature rise, rather than dielectric breakdown, may impose a limit on the applied voltage. If this seems to be a problem, try halving the thickness and doubling the area. This will give the same capacitance and loss, but with lower temperature rise. Be sure to allow a factor of safety when calculating dielectric thickness and, remember, it is peak, not rms voltages, which matter.

My current information is very vague about temperature coefficient of capacitance, so I'm not really in a position to comment. The resistivity of polythene is 10^{17} ohm-cm.

Ref 1 — GLAD Wrap is the registered trademark of GLAD Products of Australia.

* *1/7 Alfriston Street, Elwood Vic 3184*

ar

Spotlight On SWLing

*Robin L. Harwood VK7RH**

September has come around once again and propagation is rapidly changing over from Winter to Summer. Signals are no longer coming in on the lower frequencies as they were in June and July. I was able to hear both Deutsche Welle and Swiss Radio International on the 49 metre band at around 0200 UTC. This corresponds to Midday locally. These European signals come down the South Atlantic and across Antarctica judging by the auroral flutter present and usually observed three weeks either side of the shortest day (June 21st).

Don't forget that this month most major international broadcasters also alter their frequencies to take account of these propagational changes. These are introduced on the last Sunday in the month to coincide with continental Europe reverting to Central Standard Time. This Sunday has largely replaced the traditional first Sunday in September, when frequency alterations can still occur.

While tuning around the 9 MHz region in late July, I came across an Arabic speaking broadcaster on 9165 kHz. It was at around 0500 UTC that the signal peaked. I cannot find references to any clandestine operations in the Mid-east on this channel, although a Sudanese clandestine has been known to frequent it, in African dialects. This signal, though, is clearly targeted to the Middle East, possibly Iraq. I am aware that an anti-Iranian clandestine has been hovering around this spot but the programming is definitely in Arabic and not Farsi, which is the language of Iran.

And while we are on mysterious signals, there have been some unusual SSB operations down on the band edge of 7 MHz. Tune between 1200 and 1400 UTC between 7000 and 7010 and you may hear stations in Indonesian singing, whistling and generally carrying on. I doubt that these are amateur stations as there are YB nets further up the band. The stations don't appear to readily identify themselves, although there are similar SSB operations on adjacent frequencies to the 40 metre band, eg 7415, 7430, 6985 kHz. I'm sure that your divisional IARUMS co-ordinator would be interested in your observations. Details on your co-ordinator are found elsewhere in this issue.

The BBC World Service recently had 40,000 pounds sterling cut from its English programming budget by the Foreign Office. Although this shouldn't affect the overall output, it has caused cutbacks in live sports commentaries such as the recent Test Cricket series between Australia and England. Fortunately, Radio Australia was able to fill in the gap, although one region did miss out, the West Indies.

Well, that is all for this month. Don't forget, you can reach me via packet as follows: VK7RH @ VK7BBS. Until next time, good monitoring and 73

**52 Connaught Crescent, West Launceston TAS 7250*

ar

AMSAT Australia

*Bill Magnusson VK3JT**

DOVE Recovery

AMSAT news service reported last month that a serious attempt is being made to recover the DOVE satellite, DO-17. This satellite has been plagued with problems since launch and has never really worked properly. Three amateurs, WD0E, NK6K and K0RZ will be involved in the recovery program. They have had encouraging results already with uplink commands achieving correct responses from DO-17. The next step is to upload "house-keeping" software. This is being done by Harold Price NK6K. It will be a rather delicate procedure and, if successful, should result in DO-17 being restored to full operation. Keep listening on 145.825 MHz for the beacon and telemetry frames. They can be copied on a standard (1200 baud) terrestrial packet radio set-up and, as the recovery proceeds, will no doubt contain bulletins and messages reporting on progress.

EME tests of interest to satellite users

In October and November the ARRL will be holding the annual EME contest weekends. An extra event of interest to all satellite operators will take advantage of the expected increase in activity over the two weekends involved.

The Toronto VHF Society, using the callsign VE3ONT, will use the 46 metre (150 ft) diameter radio telescope at Algonquin Provincial Park, grid reference FN05XW, to make EME contacts. With such an enormous amount of gain at VE3ONT it will allow reasonably well set up satellite users to try out their stations on EME operations. VE3ONT will be active the full weekend of each contest period, October 9-10 and November 6-7, but of course they will only be able to operate EME when the Moon is in their sky! Below is the schedule of their operations.

VE3ONT will operate "split" and they ask that stations avoid calling on their transmit frequency. VE3ONT will transmit and receive with left-hand circular-polarisation (LHCP) off the dish on all bands. This means that, after reflection from the Moon, signals will be right-hand circular polarised (RHCP). This will permit them to work stations with vertical, horizontal, or RHCP polarisation, which covers the majority of satellite users. VE3ONT will transmit at the legal power limit on 144 and 432 MHz and 100 watts on 1296. Power amplifiers and receiving pre-amplifiers are located at the dish feed. Their intention is to provide an initial EME contact for as many stations as possible. Operation will be primarily on CW, although SSB might be employed depending on signal strength and number of stations calling. They anticipate being able to work OSCAR-class stations with 100 watts of output power on 144 and 432 MHz; 25 watts should be sufficient on 1296 MHz.

If you study the times mentioned below you will see that, although the Moon window is quite reasonable in Canada, it does not rise until the wee small hours in eastern Australia. An occasion such as this, however, will no doubt tempt many VK satellite operators to wait up until 2 or 4 am on those nights to (at least) test their receiving gear. This is too good an opportunity to miss. A similar test last year was a wash-out as they experienced very bad weather at Algonquin and the owners of the big dish were not willing to unlock it from its park position for an amateur operation. Peter VK3CPO and I sat up until 3 am on that occasion, listening in vain. Better luck this time!

Date	VE3ONT TX Freq	Listening range	Approx times (UTC)
Oct 9	432.050	432.050 — 432.060	0445-1830
Oct 10	144.029	144.025 — 144.030	0550-1900
Nov 6	432.050	432.050 — 432.060	0340-1700
Nov 7	1296.050	1296.050 — 1296.060	0450-1730

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies. (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and soft-ware service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia, addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

A blast from the past

I regularly receive publications from ESA, the European Space Agency. In the April issue of "Earth Observation Quarterly" I noticed an article that struck a chord. It was titled "Polar Navigation: a 23 day adventure through the Arctic with a helping hand from ERS-1". The article gave an exciting account of a journey across the Arctic ocean by a small ship, the Frontier Spirit. Not being an ice breaker, the Frontier Spirit had to negotiate a passage through the ice and was able to do this despite some anxious moments with the aid of information supplied by the ERS-1 satellite. I recalled that back in 1988 I was teaching an electronics class and several students had chosen communications as an elective unit. We had set up a listening station to monitor the downlink beacon of UoSat-2 (AO-11). The beacon was being used to transmit accurate lat/lon position data to a party of skiers who were taking part in a unique exercise, the trans-polar ski-trek. The party comprised 9 Russian and 4 Canadian skiers who were to take 100 days to travel from Cape Arctic in the Severnaya Zemlya islands to the north of Russia across the north pole to tiny Ward Hunt Island near Cape Columbia on Ellesmere Island north of Canada. We listened in day by day and plotted the position of the party on a map of the area. We joined in their celebrations when they reached latitude 90 degrees, the north pole and we celebrated again when they reached Ward Hunt Island. That map is still in my radio shack. I was struck by the similarities between these two events, separated by five years and a lot of technology. I'm sure the control station crew in this latest event could not have been more excited about the outcome than those kids in 1988.

New satellite launches

The SPOT-3 mission (Ariane V-59 from Kourou) will carry several new Oscars. The flight is presently scheduled for launch mid-September. Orbit is 800 km and inclination 98.7 degrees.

Apart from SPOT-3, there are SIX other payloads:-

Stella:	German geodetic satellite (like LAGEOS)
HealthSat:	Commercial satellite based on UoSat bus.
PoSat:	Commercial/amateur satellite based on UoSat bus.
Itamsat:	Amateur satellite based on Microsat bus.
KitSat-B:	Amateur satellite based on UoSat bus.
Eyesat-A:	Commercial Microsat (has amateur component called AMRAD).
KITSAT-B:	Mailbox (Pacsat protocol) experiment plus CCD earth imaging system and a DSP experiment.
Uplink:	145.87/145.98 MHz
Downlink:	435.175/436.50 MHz 2/2.2/5 W output power
Speed:	9600 bps
ITAMSAT:	Mailbox (Pacsat protocol).
Uplink:	145.875/900/925/950 MHz
Downlink:	435.870/820 MHz
Speed:	1200/4800 bps (experimental 9600)
AMRAD:	not planned for "routine" services. Has modem capability for 1200 and 9600 bps but is said NOT to be Pacsat compatible. Commercial payload has priority.
Uplink:	145.850 MHz
Downlink:	436.800 MHz
Speed:	300 — 9600 bps
POSAT:	Imaging (two cameras, 1 km and 200 m resolution); DSP and cosmic ray experiments; autonomous navigation with GPS and a star sensor; plus a (Pacsat protocol) mailbox.
Uplink:	145.925/975 MHz
Downlink:	435.250/275 MHz (250 primary)
Speed:	9600 bps (38.4 kbps probably)

I don't know much about the last two satellites but it should be worth keeping up with the news bulletins as the launch date approaches. I'll see if I can include some more details in the column next month.

*359 Williamstown Rd Yarraville VIC 3013
Packet: VK3JT@VK3BBS

ar

AWARDS

*John Kelleher VK3DP**

Awards Information

The current DXCC standings were published in the August edition of AR magazine. Some listings may appear to be incorrect, but this is caused by receipt of alterations and upgrades too late to be entered into the DXCC database. Please remember that I am publishing the listings each February and August.

When I receive your additions and upgrades, they are thoroughly checked, then entered on to master sheets, accompanied by a running sheet, which lists all "transactions" as they occur. When this process is concluded, all changes are entered on the database.

Please, when forwarding your claims for upgrades to your listings, just include those DX countries that are verified additions to your earlier achievements. Then, at a glance I can see how many countries you have worked and confirmed.

I have been your Federal Awards Manager now for two years, and apart from the late and great Joe Ackerman, and Bob Jackson VK7NBF, I have yet to see in print the names or identities for the individual State Awards Managers. If, and I say this reservedly, we had a strong cadre of State representatives, then quick and reliable references could be made to any or all available awards. I receive many requests from overseas amateurs for information, and, though I hate to admit it I am left floundering for answers. My immediate loyalty is to the Federal Awards scene, but I would like to see all the Australian Awards grouped together. Previous requests for this type of information have been very sparsely answered, I would say frugal. I think that the time is opportune, while we have a lull in Solar cycle activity, to get organised, and await the climb to cycle 23. Admittedly, most of our "internal" nets are located on 80 metres, but some are accessible on other bands eg *The Tasmanian Devil Net Award*, where contacts on other bands qualify for the Award. There are probably quite a few that fall into this category but, again, information is frugal.

With this in mind, I would like to see created a list of
(a) WIA Divisional Awards,
(b) Club sponsored Awards within each State and, where possible
(c) Ample warning of any special event Awards.

The whole concern under the control of appointed State Award Managers, who could, at their discretion, forward advice for publication on the above.

By now, all members of the DXCC Honour Roll will have received stickers to attach to their certificates. The idea for these stickers was not my brainchild, but that of Gray Taylor VK4OH.

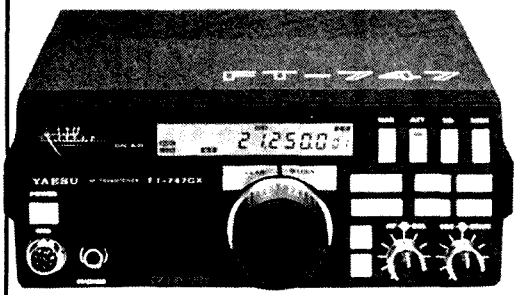
For those members of the Honour Roll that I have not yet contacted personally, could you now please send profile information plus photographs for publication in the AR magazine.

Now here are some more DX Awards, which may interest you. They fall into the not-so-easy, not-so-hard category.

Alaskan DX Certificate

This award requires contacts with 10 Alaskan amateurs as follows. One each from Southeastern (that part of KL7 east

NOW'S YOUR CHANCE! YAESU PRICES SLASHED!

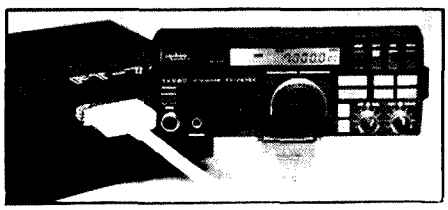


2 Year Warranty
FT-747GX Compact H.F Transceiver

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts PEP output on all 1.8-30MHz amateur bands, and general-coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and an easy-to-read backlit digital display, dual tuning steps for each mode, dual VFO's for split-frequency operation, and 20 memory channels. Wideband 6kHz AM and narrow 500Hz CW IF filters are also a standard feature. Complete with Yaesu MH-1 hand microphone.
Cat D-2930

$1299

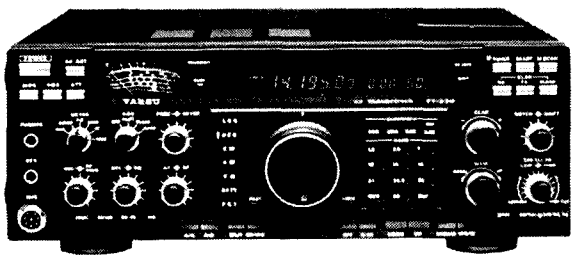
WITH ANTENNA BONUS!
Your choice of 2 'Mobile One' mobile HF antennas from our range of 80m, 40m or 20m whips. Worth Over **$90**



RMK-747 Remote Mounting Kit

This modification kit allows the front panel of the FT-747GX to be mounted away front the body of the transceiver. Price includes installation on your FT-747GX.
Cat D-2931

$349
SAVE $100



2 Year Warranty
FT-990 H.F All-Mode Base Transceiver

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM), with high duty cycle transmission allowed.
An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 90 memories and one-touch band selection. Microphone optional extra.

FT-990 DC Version
(Requires 13.8V)
Cat D-3255

SAVE $200

***Only* $2995**

EXCESS STOCK CLEARANCE! - BELOW COST!

Great for 10M FM repeater operation!

2 Year Warranty
FT-650 6m, 10m, 12m 100W Transceiver

Now's the time to get ready for the summer DX season on the 6m and 10m bands, and the Yaesu FT-650 mobile transceiver allows you to do it in style. Its all-mode operation, 100W RF output (SSB, FM, CW), and continuous 24.5 to 56MHz receiver coverage allows you to hear signals outside the Amateur bands, so you can track the rising M.U.F and work stations as soon as the band opens. The use of 3 D.D.S's and a 2-stage low noise RF pre-amp results in a very quiet and sensitive receiver (SSB/CW, 0.125uV). To cater for the FM enthusiast, the FT-650 provides repeater offsets, as well as exceptional 0.16uV (12dB SINAD) sensitivity. Other features include selectable tuning steps, manual/auto IF notch filter, RF speech processor, IF shift control, 105 scannable memories and an effective noise blanker. Includes MH-1 hand microphone.
Cat D-3250

UNBEATABLE VALUE **$1695**

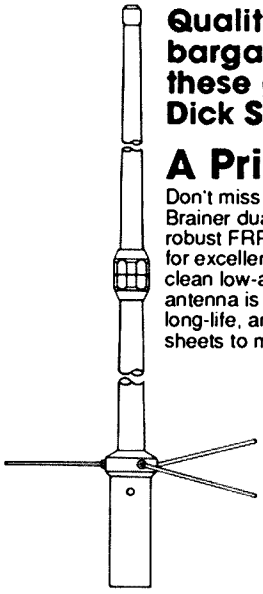
B 1531

Pick Up More With These BRAINER Bargains!

Quality Japanese antennas at a bargain price. Don't miss out on these great specials, exclusive to Dick Smith Electronics!

A Price Breakthrough!

Don't miss our best ever prices on these high performance Brainer dualband 2m/70cm base station antennas. They use robust FRP (fibreglass reinforced polyester) tubing construction for excellent all-weather operation, and a ground-plane for a clean low-angle radiation pattern which maximises gain. Each antenna is rated at 200W, uses stainless steel hardware for long-life, and comes with detailed locally-written instruction sheets to make construction easy.



Compact GST-1 2m/70cm Antenna

Frequency	144-148MHz, 430-450MHz
Gain	6dB on 2m, 8dB on 70cm
Length	2.5m
Type	2 x 5/8 wave (2m) 4 x 5/8 wave (70cm)

Cat D-4830

$179 **SAVE $20**

BRAINER

Long Range GST-3 2m/70cm Antenna

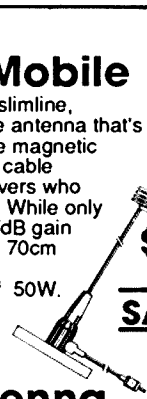
Frequency	144-148MHz, 430-440MHz
Gain	7.9dB on 2m, 11.7dB on 70cm
Length	4.4m
Type	3 x 5/8 wave (2m) 7 x 5/8 wave (70cm)

Cat D-4835

$269 **SAVE $10**

2m/70cm Magnetic Mobile

The black TM-723M is a slimline, compact dualband mobile antenna that's supplied with a low-profile magnetic mount and low-loss coax cable making it ideal for city drivers who can't use a long antenna. While only 0.7m high, it provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a conservative maximum power rating of 50W.
Cat D-4812

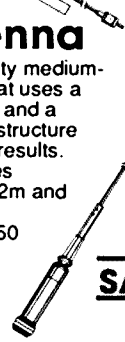


BRAINER

$69.95 **SAVE $20**

2m/70cm Mobile Antenna

The ST-7500 is a high-quality medium-sized dual-band antenna that uses a ground-independent design and a tiltable stainless steel whip structure to provide excellent mobile results. It's just 1m long, yet provides approximately 3dB gain on 2m and 5.5dB gain on 70cm with a maximum power rating of 150 watts. Requires an SO-239 antenna base or SO-239 magnetic base.
Cat D-4810

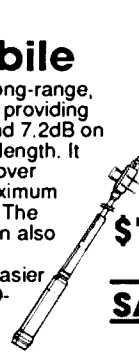


BRAINER

$69.95 **SAVE $10**

2m/70cm Hi-Gain Mobile

The ST-7800 is our best long-range, dualband mobile antenna, providing high gain (4.5dB on 2m and 7.2dB on 70cm), while only 1.5m in length. It incorporates an inbuilt tilt-over mechanism and has a maximum power rating of 150 watts. The ground-independent design also allows the use of gutter or boot/bonnet brackets for easier mounting. Requires an SO-239 antenna base.
Cat D-4815

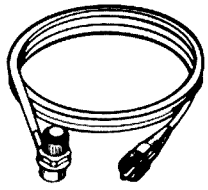


BRAINER

$119.95 **SAVE $10**

SO-239 Base/Lead Set

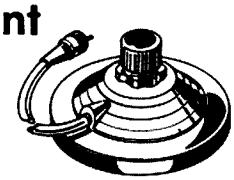
A convenient way to mount a PL-259 type antenna. This quality Japanese SO-239 base is pre-wired with 4m of low loss coax cable and has a PL-259 already fitted for connection to your transceiver.
Cat D-4052



$24.95 **SAVE $5**

SO-239 Magnetic Antenna Mount

A powerful Japanese magnetic mount for use with PL-259 antennas. It's supplied with 4m of quality coax cable and fitted PL-259 plug. Suits small to medium VHF/UHF antennas such as the ST-7500.
Cat D-4520



$59.95

PHONE & MAIL ORDER SERVICE & YAESU BROCHURE HOTLINE
Outside Sydney (Free Call) 008 22 6610 Sydney & Enquiries - (02) 888 2105
Fax: (02) 805 1986 or write to Dick Smith Electronics, Mail Orders, Reply Paid 160 PO Box 321 NORTH RYDE NSW 2113

Yaesu stocks and some antennas not held at all stores, please contact your local store for stock availability, or order by phone 008 22 6610

DICK SMITH ELECTRONICS

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1855 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 8622 • Kotara 56 2092 • Liverpool 600 9888 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney (Greenwood Plaza) 964 9467 • Orange 618 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 ACT• Belconnen (06) 253 1785 • Fyshwick 280 4944 VIC • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 326 6088 & 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0522 QLD • Booval 282 6200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 6255 • Maroochydore 791 800 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 SA• Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6088 • St Marys 277 8977 WA • Cannington 451 8666 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 TAS • Hobart 31 0800 • Launceston 344 555 NT • Darwin 81 1977

of 141° W longitude), Northern (above the Arctic Circle) Aleutian Islands (including Kodiak Island, and the Alaskan peninsula south of 58° N), and Central Alaska (including Anchorage and Fairbanks). The remainder may be from any part of KL7. However, of these 10, 4 must be members of Anchorage ARC.

Any modes or bands (except WARC bands) apply. Contacts since 1st January 1955. There is no fee, but ample covering postage is required. A GCR list checked by 3 (three) licensed amateurs or an official at national level is required. The address for applications is:
Anchorage ARC KL7AA
Box 101987
Anchorage Alaska 95510

Alaska Forty-Niner Award

Complete two-way communications with the four prefixes of Alaska, namely AL7 KL7 NL7 and WL7, plus 9 other additional Alaskan contacts for a total of 13. The fee is 10 IRC, or equivalent for the award plus postage. QSL cards or GCR list go to:
ADXA Secretary
C/- PO Box 1614
Kodiak Island Alaska 96615

Ascension Island Awards

1. The Air Bridge Award. Work one station in the British Isles.
2. The Ascension Island Award. Work at least 3 stations on Ascension Island.
3. South Atlantic Award. Work at least one station on each of the South Atlantic dependencies: Ascension, St Helena and the Falklands.

General requirements: no time, band, or mode limitations. GCR list and fee of 10 IRC or US$5.00 to:
Award Manager
PO Box 2
Ascension Island South Atlantic

From Belgium....The Worked All Belgian Provinces Award

Work all provinces on not more than 2 Amateur bands. No date limits. GCR list and US$3.00 to:
ON5KL UBA HF Award Manager
VanCampenhout Mat
Hospicestraat 175
B-9080 Moerbeke — Was
Belgium
The Provinces are...

AN Antwerp	LU Luxembourg
BT Brabant	OV East Flanders
HT Hainant	NR Namur
LG Liege	WV West Flanders
LM Limbourg	

**Federal Awards Manager, PO Box 300 Caulfield South VIC 3162*
ar

ALARA

*Robyn Gladwin VK3ENX**

ALARAMEET

Here is the final report on the long awaited *Get Together* from Margaret Loft VK3DML, the Co-ordinator.

We now have 90 names on the list with about half of these definitely confirmed. For those of you unable to attend, please send a photo and a short message to go on a pin-up board; that way you can take part and also help us put a face to your voice and call.

If you have a hobby or craft, please bring a small sample along to show; on Saturday night at our Dinner, Marilyn will have her prize winning stamp collection on display. In early September, I will be posting out a map of the area, the final program, and also the black and gold ribbons for your car. If you are leaving before then, please send me an address I can send them to; I will be on the 222 net when possible, also the Travellers' net to keep in contact with you. The 2 m repeater for this area is VK3RCV on 147.150. Please call Judy VK3AGC/NYL or myself when you are within range. We will be listening for you.

We still have room for more, so do come if you can for the weekend or a day, as we would like everyone to share in the activities arranged. Safe travelling and we'll look forward to welcoming you to Castlemaine.

Thank you, Margaret, for taking on the organisation of our triennial YL meeting.

WICEN and ALARA

Three of our members play an important role in WICEN activities. Marilyn Syme VK3DMS, is the Region N Co-ordinator for Victoria, and also the Far South-West Regional Co-ordinator for New South Wales. Marilyn spends much of her time organising communications for various events. However, the Mildura Ski 100 at Easter and the Coomealla Club 500 Off-Road Car Rally in August provide her with the greatest challenge.

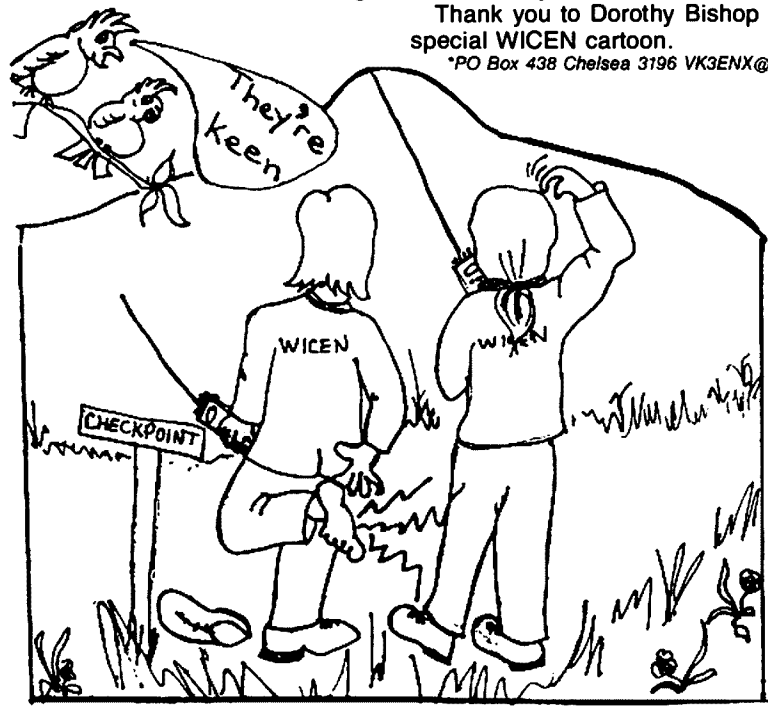
In South Australia, Joy Charles VK5YJ, has been involved with WICEN for over 10 years. Although Joy no longer takes on quite as much responsibility as she did in the past, she is still regarded as a leader in the organisation.

Pauline Jones VK2GTB is WICEN State Supply Officer for NSW. She was involved with the International Six Enduro held at Cessnock. It was the first time this event had been held outside Europe and the communications had always been provided by the army. This was a huge event held over 6 days, involving a total of 40 operators. The Hunter region has also hosted the Forster Triathlon, the largest International Triathlon to be held in Australia.

It is to be hoped that other YL amateurs will be encouraged to join Marilyn, Joy and Pauline in this vital service provided for the wider community by one branch of our hobby.

Thank you to Dorothy Bishop for her special WICEN cartoon.

**PO Box 438 Chelsea 3196 VK3ENX@VK3YZW*
ar



Club Corner

Camp Quality

This is to inform the amateur radio fraternity that there will be a Special Events Station operating at "Camp Quality" (Kids with Cancer) in the Tweeds Heads area from the 3rd to the 9th April 1994. It will be manned mainly by the VK4 Gold Coast Amateur Radio Society (Inc). The station call sign will be VI2CQ, the operating frequencies will be: 7.050; 14.150; 21.150 and 29.550 MHz, all +/- QRM.

To be in keeping with the children's activities, the hours of operation will be approximately 2300 to 0000 UTC and 0300 to 0500 UTC; these times may be changed if radio propagation and interest in our station warrants re-scheduling.

It is hoped we may be able to operate VHF from the hot air balloon (with the pilot's permission) that will be tethered in the grounds, at a height of 300 ft (100 m).

QSL via VK2CYI, VK2 Bureau. A QSL card will be sent for all contacts.

Don VK2CYI

Old Timers Club

Membership of the Radio Amateurs Old Timers club is open to anyone who has held or has been entitled to hold an amateur operators licence for 25 years or more. Obviously this includes a large number of people who qualified after World War II so it's not just for old fogies from the twenties and thirties.

As from now membership costs only $5.00 per year and the financial year runs from July to June. Apart from an Australia wide broadcast of news and information on the first Monday of each month, members get two issues of the club magazine "OTN", one in March and the other in September.

The monthly broadcasts originate from Melbourne as follows:
10.00 am 145.700 MHz FM and 7.060 MHz SSB.
11.00 am 14.150 MHz SSB beaming north.
12.00 noon 14.150 MHz SSB beaming west.
08.30 pm 3.635 MHz SSB.

Call backs follow each transmission and we invite interested listeners to check in on these occasions.

In Melbourne there will be a luncheon at the Bentleigh Club toward the end of September while in Adelaide there will be the annual luncheon at the Marion Hotel in Mitchell Park. The secretary of the RAOTC is Arthur Evans VK3VQ who is QTHR in any call book and by phone at 03 589 3822.

Allan Doble VK3AMD

Moorabbin & District ARC

Long time members of the club are happy about the decision taken about five years ago to update the club station VK3APC and install it in a dedicated enclosure. A lot of our younger members have taken an increasingly active part in the operation of the station and its maintenance. They run the club net on 3.567 MHz every Monday night at 8 pm and this allows operators who come across the net to gain points for the very attractive certificate which is available for working VK3APC club members on the net. It's not very hard to earn the wallpaper in one or two nights.

Contesting through VK3APC is another side of the club's activities which is building up. VK3APC came second in the open phone multi-operator section of the John Moyle contest and we expect to be well up in the score for the Novice contest. Plans are well in hand for taking part in the RD contest.

A new activity is the Hobby Night each Tuesday evening in the club rooms when Chris VK3JEG is on hand to help members with gadgets they are building or have built without success. This is the sort of activity for which the club was famous in its early days.

At the annual general meeting in July the following office bearers were elected: President: Denis Babore VK3BGS. Secretary: Keith Turner VK3CWT. Treasurer: Morrie Lyons VK3BCC. Projects Manager: Harold Hepburn VK3AFQ.

Membership fees have been increased a little after careful consideration and are now: Joining $10. Full member: $20. Students/Pensioners: $15. All correspondence should be addressed to the secretary at PO Box 58 Highett VIC 3190

Allan Doble VK3AMD

Shepparton and District ARC Inc

Shepparton 1993 Communications Day

Due to ever increasing attendances the Shepparton and District Amateur Radio Club has moved its 1993 Communications Day to a larger venue. It is the Shepparton Youth Club Hall, located in Rowe Street. The event will take place on Sunday 26th September. Doors will open at 10 am.

The larger venue will allow the commercial trade companies, specialist groups and those wishing to dispose of preloved equipment more room to spread out.

Admission remains at $5 per head or $15 per family. After the five star meal last year, the catering committee suffered burnout and this year catering will be provided by another club. A little more basic but more varied choice will be the order of the day. The usual free tea and coffee will be available all day.

Major traders have again indicated that they will be attending and the usual show specials will allow you to save plenty on the purchase of new equipment. Several guest speakers have expressed interest in leading discussions relevant to the hobby of amateur radio.

If you have equipment that you wish to dispose of it is necessary that you pre-book a table. This will give you the best chance of a prime display location. Just arriving on the day without booking may see you banished to the back corner or, worse still, missing out as the club is hiring the tables for this use.

Requests for disposals tables and payment must be made in advance and in writing to the club at PO Box 692, Shepparton, 3630. Table cost is $15 per 2 metres plus the normal admission charge per person.

Talk-in will be provided by VK3SOL on VK3RGV frequency 146.650 MHz. Shepparton is located 180 km north of Melbourne on Highway 39.

Members of the Shepparton and District Amateur Radio Club look forward to seeing you on Sunday 26th September at the 1993 Communications Day.

Peter VK3YF
Publicity Officer

Ballarat Amateur Radio Group

On Friday the 30th July the Ballarat Amateur Radio Group held their Annual General Meeting. The meeting was well

attended and resulted in the election of the office bearers who will be conducting the affairs of the club for the coming year.

The Committee for 1993/4 will be headed by:
PRESIDENT Cliff Bilston (VK3CCB)
SECRETARY Geoff Smith (VK3ADB)
TREASURER Harry Hekkema (VK3KGL)

The retiring Secretary, Jim Wright VK3CFB, was awarded Life Membership of BARG in appreciation of his 10 years service to the club in that position.

The new committee is already in action making preparations for the Ballarat Hamvention which will be held on October 30/31. Details will be forthcoming as they are confirmed, so watch this space.

Norm D'Angri VK3LBA
Publicity Officer BARG

Granite Belt Amateur Wireless Group

We are a self-managed team NOT a club. We don't have a hierarchy, office bearers, fees, constitution, fragile egos or other BARRIERS. We all have different foci within our hobby, but our common bond is WIRELESS, specifically:

- you own and operate VALVE HF equipment (excluding power amplifiers)
- you WANT to belong
- you reside in the Queensland "Granite Belt" which is a trapped rock corridor extending from the VK2 border to Dalveen and about 20 km wide. Some of the inclusions are Ballendean, Glen Aplin, Sevenlea, Stanthorpe, Applethorpe, Amiens, Pozieres, Passchendael, The Summit, Thulimbah, Cottonvale and Dalveen.
- you are interested in amateur radio.

Our group station (courtesy VK4CMY aka VK5HP "Doc") is RACAL RAI7 and AR88 receivers, FTDX560, FT100 transceivers, SB201 and FLDX2000 amplifiers plus numerous other valve type HF rigs coupled to 80, 40 and 20 metre ground planes with extensive radial systems (1.5 hectares).

The Granite Belt is the second-most ferocious lightning activity area in Australia, hence the focus on valve equipment in which induced voltages do little damage. VK4CMY "Doc" has lost 2 VCRs and 2 TV sets in 18 months due to induced voltages in solid state equipment. So we are not time-warped weirdos, there is a very practical reason for our focus on valves other than that they are like steam engines — ageless!

We worked the John Moyle contest in '93 under VK4AKH Lurch's call and plan to attack a few more contests in the future. Some of our members are on alternative power and this affects our involvement, but the range of interest covers collecting AM radios, collecting valve linear amplifiers, SEQTA activity (4WD trekking), packet, CW, QRP, portable operation, mobile activity, rolling-our-own (home building), crystal sets, old magazine and ARRL handbooks, DX chasing, antenna building, and above all, helping each other.

We prefer to swap and barter rather than to buy or sell. Our group members run FT200, FT101B, FTDX401, FTDX560, TS520, Drake, Hallicrafters, Heathkit, AWA, Weston, Hammarlund, Racal, Collins and Signal One HF equipment and we enjoy our politics-free hobby!

"Doc" VK4CMY Dalveen Qld

Radio Old Timers Club of South Australia

The annual luncheon will be held on Tuesday 26th October 1993 at 12 noon at the Marion Hotel, Marion Road, Mitchell Park. This year we invite amateurs 60 years and over who have held, or are eligible to hold, an Amateur Radio licence for 10 years and over to join us.

Committee members at present are:
President John Allan VK5UL (Ph 344 7465)
Secretary Ray Deane VK5RK (Ph 271 5401)
Jack Townsend VK5HT (Ph 295 2209)
Lew Schaumloffal VL5AKQ (Ph 263 0882)

RSVP by 22nd October 1993 to the above. Ladies are welcome.

Those using public transport — STA Bus 243 alighting at stop 24.

R Deane VK5RK

The Australian Naval Amateur Radio Society

The AUSTRALIAN NAVAL AMATEUR RADIO SOCIETY brings together all radio amateurs and interested short wave listeners in Australia who have a professional naval or maritime background. This is an Australian society controlled by Australians. All funds raised are used to benefit members within Australia. We are a nationwide society, fully structured and with administration facilities in place. Along with our name, the Society's logo shows a stockless anchor representing the sea, "flashes" representing radio and the seven-pointed Federation Star of Australia.

Membership is open to all persons who are either serving in, or are retired from, the Royal Australian Navy, WRANS, Naval Reserves or the Australian Merchant Navy. Membership is also open to those who have served in ANY foreign navy or merchant navy and who are now Australian citizens, or permanent residents in Australia. Foreign amateurs who have similar nautical backgrounds can become Associates of the ANARS but without voting privileges. Hence this Society cannot come under foreign control.

Until now those interested in belonging to a Naval or Maritime amateur radio society have been forced to join overseas organisations. Not only has 75% of the money raised in Australia gone to the benefit of overseas amateurs, but the most popular of the overseas societies is under the control of its Ministry of Defence. To expect Australian amateurs to join a society controlled by a foreign government is unacceptable in the 1990s.

On the 9th of August this year the AUSTRALIAN NAVAL AMATEUR RADIO SOCIETY was officially launched by its Headquarters station in Canberra using the callsign VK1RAN. The 9th of August is a significant date for the Royal Australian Navy. It is the anniversary of the World War Two Battle of Savo Island, in which the Australian heavy cruiser HMAS CANBERRA was sunk.

All interested amateurs and short wave listeners are invited to contact the Honorary Secretary of ANARS at 467 McKenzie St, Lavington, NSW 2641 for further details.

Terry Clark VK2ALG Hon Secretary
ar

CONTESTS

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Sep-Nov 93

Sep 4/5	All Asia DX Contest (SSB)	(Jul 93)
Sep 5	Bulgarian DX Contest	(Aug 93)
Sep 11/12	Worked All Europe (SSB)	(Jul 93)
Sep 18/19	SAC DX (CW)	(Jul 93)
Sep 25/26	SAC DX (Phone)	(Jul 93)
Sep 25/26	CQ WW RTTY DX Contest	(Jul 93)
Oct 2/3	VK/ZL/Oceania DX Contest (SSB)	
Oct 3	RSGB 21/28 MHz Contest (SSB)	
Oct 9/10	VK/ZL/Oceania DX Contest (CW)	
Oct 9/10	Iberoamericano Contest (SSB)	
Oct 13/14	YLRL Anniversary Party (CW)	
Oct 16/17	Worked All Germany Contest (Mixed)	
Oct 17	RSGB 21/28 MHz Contest (CW)	
Oct 23/24	CQ WW DX Contest (Phone)	
Oct 27/28	YLRL Anniversary Party (SSB)	
Nov 1/7	HA-QRP 80 m CW Contest	
Nov 13	ALARA YL/OM Contest (Mixed)	
Nov 13/14	WAE RTTY DX Contest	(Jul 93)
Nov 13/14	OK-DX CW Contest	
Nov 13/14	ARRL International EME Competition	
Nov 27/28	CQ World-Wide CW DX Contest	

In the next couple of months there will be a variety of contests catering for all tastes with, of course, our own VK/ZL/Oceania DX Contest in the middle. The rules are little changed from previous years, apart from the introduction of a multioperator category, separate scoring for each band (so entrants can compare their performance with others on a band by band basis), and the ability to submit logs on disk.

Speaking of disk logs, the number of contacts made in some contests is staggering. Consider the CQ WPX contests, where entrants routinely work thousands of stations. It is easy to see that manual checking of scores in hundreds of such logs represents a massive undertaking. To ease this task ARRL and CQ have introduced log checking programs, and disk logs are now entered directly into the computer, which cross-checks them automatically. To close the gaps, high scoring logs received on paper are scanned or typed in by hand.

One of the things these programs do is to report the incidence of "uniques" for each entrant (ie callsigns which don't appear in any other logs), which generally ranges from about 2 to 15%. Careful study has shown that most "uniques" are due to calls being miscopied, rather than the other stations making one contest QSO and then retiring. Many managers of overseas contests are now encouraging logs to be forwarded on disk, and it probably won't be long before it becomes generally *mandatory* for logs to be on disk, if the number of contacts exceeds a prescribed threshold.

This is good news for entrants, as mistakes will be more likely to be picked up, and the results will more accurately reflect actual standings. The faster operators will need to be more meticulous in their receiving accuracy and, except for casual contesters, we will all need to gear up for computerised logging (or log formatting after the event). These are exciting times, and I hope to report soon on the preferred format for disk logs.

Many thanks to the following for their help, information, and inspiration: HA5JJ, OK2SW, VK3DMS, VK5AGX, ZL1AAS, ZL1BVK, CQ, QST, and Radio Communications. Please keep the letters coming, including any spare copies of rules or results. Until next month, good contesting!

SEANET DX Contest Update

The address shown in last month's column is incorrect. According to QST (for this year's contest) it should be: "SEANET 93, Maxwell Road PO Box 2728, Singapore 9047, Singapore."

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in April AR.

RSGB 21/28 MHz DX Contest

Oct 3 (Phone), Oct 17 (CW); Sunday 07-19 z.

This year the phone section of this contest occurs one week earlier than usual, and will overlap the VK/ZL/Oceania phone section by 3 hours. This should provide the opportunity for plenty of contacts with the UK on 21 and 28 MHz, and perhaps improve upon last year's poor turnout of VKs and ZLs in the 21/28 MHz Contest!

The object is to work as many UK stations as possible on 21 and 28 MHz (UK includes GI, but *not* EI). Categories are: single operator, multioperator, and SWL. The CW section includes a QRP category for stations not exceeding 10 W output. Entrants using packet or DX spotting nets must enter the multioperator category. The recommended frequencies for phone are 21150-21350 and 28450-29000 kHz.

Send RS(T) plus serial starting at 001; UK stations will add their county code. Score 3 points per QSO. The final score equals the total points times the total multiplier (both bands). (The same multiplier may be claimed on both bands). Use a separate log for each band. Send logs and summary sheets, to arrive by 1st December (phone) or 13th December (CW), to: RSGB HF Contests Committee c/o G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England. A comprehensive range of awards is offered.

SWLs may only log UK stations making contest QSOs with overseas stations. SWL logs should be headed time UTC; callsign heard; number sent by that station; callsign of station being worked; new multipliers; points. In the column headed "station being worked" the same callsign may only appear once in every 3 QSOs except when the logged station counts as a new multiplier. HF TX licence holders are ineligible to enter the SWL section.

IberoAmericano Phone Contest

20 z Sat Oct 9 — 20 z Sun Oct 10.

This phone only contest is held each year on the weekend before October 12 to commemorate the anniversary of the discovery of America, and provides a good opportunity to work the rarer Latin-American areas. Classes are single and multioperator (single TX); QRP max 5 W output; SWL. Exchange RS plus serial number. Bands 1.8-30 MHz. Score 3 points per QSO with a Latin-American station, 1 point with others. Multipliers are Latin-American countries: CE CO CP CR CT CX C3 C9 DU EA HC HI HK HP HR HT KP4 LU OA PY TG TI XE YS YV ZP 3C.

Additional multipliers may be claimed for contacting "multiplier stations", which can be identified by a commemorative prefix from a Latin-American prefix block followed by the year (93). Last year they were EG92G and EH92G. Final score is total QSO points times total multipliers, all bands. SWLs: the same station cannot be logged for more than 15% of the total; also the same station can only be logged again after 5 other entries. Send logs by 30th November to: X-Concurso Iberoamericano, Gran Via de les Corts Catalanes, 594, 08007 Barcelona, Spain.

YLRL Anniversary Party

Oct 13/14 (CW); Oct 27/28 (Phone); 1400 z Wednesday to 1359 z Thursday.

These midweek contests are open to YLs only, worldwide, 1.8-30 MHz. Stateside frequencies, ± 15 kHz, are: (CW) 3555, 7055, 14055, 21135, 28195; (SSB): 3955, 7255, 14265, 21395, 28395; (or as authorised).

Exchange RS(T), QSO number, and US State, VE Province, or DXCC Country. Oceania YLs score 2 points per QSO outside Oceania, 1 point per QSO within

Oceania. Final score is the total QSO points times total States, Provinces, and DXCC Countries worked. A bonus multiplier of 1.5 applies for 100 W max output (CW) or 200 W pep output (SSB).

Send separate logs for CW and phone sections, with summary sheets, to be received by 30 November to: L. Carla Watson, YLRL Contest Logs, 473 Palo Verde Drive, Sunnyvale, CA 94086, USA.

Worked All Germany Contest (Phone/CW)

15 z Sat Oct 16 — 15 z Sun Oct 17

The object of this contest is to promote contacts between Germany and the rest of the world on 80-10 m. DX packet spotting is allowed for all stations. Classes (SSB or CW) are: single operator; multioperator; QRP (max power ?); and SWL. Send RS(T) and serial number; German stations will send RS(T) and DOK number. Score 3 points per QSO with a German station. Multipliers are German districts (determined by the first letter of the DOK number). Final score equals points times multiplier. Send logs and summary sheets, postmarked no later than 30 days after the contest, to: Klaus Voigt DL1DTL, PO Box 427, O-8072 Dresden, Germany.

CQ WW DX Contest

Oct 23-24 (Phone); Nov 27-28 (CW).

0000 z Saturday to 2400 z Sunday

Sponsored by CQ Magazine, these contests are undoubtedly the premier HF events of the year, and present the opportunity to work many rare countries and zones even with modest equipment. They are open to all stations world-wide, on 1.8-29.7 MHz (no WARC bands). Categories are: single operator; single operator low power (max 100 W output); single operator QRPp (max 5 W output); single operator assisted (for those using DX spotting nets); multioperator single transmitter; and multioperator multitransmitter.

Single operator stations can enter as single or all band, and can change bands at will. Multioperator stations must enter as all band. Multioperator single TX stations must stay on a band for at least 10 minutes, EXCEPT that one — and only one — other band may be used during the 10 minute period, if — and only if — the station worked is a new multiplier. Multi TX stations are exempt from this rule, but can only radiate one signal per band at any one time.

Exchange RS(T) plus CQ zone (29 = VK6/8/9C, 30 = other VK). Score 3 points for QSOs with stations in a different continent, and 1 point for QSOs with stations in the same continent (for VKs this means Oceania as defined for WAC). Stations in the same country or call area can be worked for additional multiplier credit, but have zero points value. The total multiplier is the number of DXCC countries plus zones worked. Final score equals total points times total multiplier.

Use a separate log for each band. Show new multipliers in the log the first time they are worked, and duplicates with zero points. Entrants are encouraged to include a "dupe sheet" for each band, which becomes mandatory for 200 QSOs or more. Computer logs are welcome, and must be in ASCII on DOS disk, using separate files for each band, eg VK7AAA.20 for a 20 m log; alternatively in K1EA "CT" .BIN format, eg VK7AAA.BIN. Label the outside of the disk with the callsign, the files included, mode, and category. Disks MUST be accompanied by a paper printout satisfying logging instructions. The committee may request a disk from high scoring stations to enable the log to be checked by computer, if the log originally submitted was a computer printout.

Include a signed summary sheet, showing power output for low power and QRPp entries, and send the log postmarked by December 1 (phone) or January 15 (CW) to: CQ Magazine, 76 North Broadway, Hicksville, NY 11801, USA. Indicate Phone or CW on the envelope. Numerous awards, trophies and plaques will be awarded to the leading entrants in the various categories and countries.

County Codes for RSGB Contests

As RSGB contests are quite popular in VK, the following list of UK county codes should be helpful for entrants in those contests:

Alderney	ALD
Co Antrim	ATM
Co Armagh	ARM
Avon	AVN
Bedfordshire	BFD
Berkshire	BRK
Borders	BDS
Buckinghamshire	BUX
Cambridgeshire	CBE
Central	CTR
Cheshire	CHS
Cleveland	CVE
Clwyd	CLD
Cornwall	CNL
Cumbria	CBA
Derbyshire	DYS
Devon	DVN
Dorset	DOR
Co Down	DWN
Dumfries & Galloway	DGL
Durham	DHM
Dyfed	DFD
Essex	ESX
Co Fermanagh	FMH
Fife	FFE
Mid Glamorgan	GNM
South Glamorgan	GNS
West Glamorgan	GNW
Gloucester	GLR
Grampian	GRN
Guernsey	GUR
Gwent	GWT
Gwynedd	GDD
Hampshire	HPH
Hereford & Worcester	HWR
Hertfordshire	HFD
Highlands	HLD
Humberside	HBS
Isle Of Man	IOM
Isle Of Wight	IOW
Jersey	JER
Kent	KNT
Lancashire	LNH
Leicestershire	LEC
Lincolnshire	LCN
Greater London	LDN
Co Londonderry	LDR
Lothian	LTH
Greater Manchester	MCH
Merseyside	MSY
Norfolk	NOR
Northamptonshire	NHM
Northumberland	NLD
Nottinghamshire	NOT
Orkney	ORK
Oxfordshire	OFE
Powys	PWS
Shropshire	SPE
Sark	SRK
Shetland	SLD
Somerset	SOM
Staffordshire	SFD
Strathclyde	SCD
Suffolk	SFK
Surrey	SRY
East Sussex	SXE
West Sussex	SXW
Tayside	TYS
Tyne & Wear	TWR
Co Tyrone	TYR
Warwickshire	WKS
Western Isles	WIL
West Midlands	WMD
Wiltshire	WLT
North Yorkshire	YSN
South Yorkshire	YSS
West Yorkshire	YSW

Results of 1992 RSGB 21/28 MHz DX Contest

Phone, Oceania (Posn/Call/Score):

1	ZL1AAS*	2754
2	VK9CC	174

Phone, SWL (Worldwide, non-UK):

5 Alan Winter (VK6) 2633

CW, Oceania (Posn/Call/QSOs/Mult/Score):

35	VK8AV*	58	33	5440
59	VK4TT	33	22	2024

* = award winner

Results of 1992 ARRL 10 m Contest

VK2APK was 3rd worldwide in the DX Mixed Mode Low Power section. In the DX CW Low Power section, VK8AV was 5th worldwide and VK4XA 8th. VK8AV also had top score for CW in Oceania.

Call/Score/QSOs/Mult/Power Output (A<5 W, B<150 W, C>150 W):

Mixed Mode:				
VK2APK	636,916	1132	161	B
VK8BE	10,906	101	41	B
P29JA	234	9	9	B
Phone Only:				
VK4DMP	71,022	399	89	B
VK2GAH	53,690	455	59	C
VK4ICU	23,548	203	58	B
VK4NEF	4,440	74	30	A
CW Only:				
VK8AV	499,500	999	125	B
VK4XA	408,020	887	115	B
VK4TT	228,492	577	99	B
VK2AYD	153,032	407	94	B
VK4XW	7,656	58	33	B

Results of 1992 ARRL EME Competition

VK5MC scored 48,000 points in the single operator multiband category with 3 QSOs on 144 MHz, 15 on 432 MHz, and 6 on 1296 MHz. There were no other VK entries.

1993 VK-ZL-Oceania DX Contest Rules

WHEN: This contest takes place each year on the 1st and 2nd full weekends of October (SSB and CW sections respectively). For 1993 the dates are:
SSB: 2/3 October 1993, 1000 UTC Saturday to 1000 UTC Sunday
CW: 9/10 October 1993, 1000 UTC Saturday to 1000 UTC Sunday

OBJECT: The object is for stations throughout the world to contact as many stations in VK, ZL and Oceania as possible on 1.8-30 MHz (no WARC bands). The boundaries for Oceania are as for WAC.

Contacts between different countries in Oceania are permitted (eg VK to ZL, ZL to 5W, VK4 to VK9), and contacts within the same country in Oceania are permitted on 160 and 80 m only (eg VK5 to VK6, ZL4 to ZL4, 3D2 to 3D2).

CATEGORIES: Single operator all band; single operator single band; multioperator all band; and SWL. Single operator stations are where one person performs all operating, logging, and spotting functions. The use of DX spotting nets will place the station in the multioperator category.

EXCHANGE: RS(T) plus a 3 digit number starting at 001 and incrementing by 1 for each contact. If 999 is reached, revert to 001.

MULTIPLIER: On each band this is the number of prefixes worked on that band. A "prefix" is the letter/numeral combination forming either the first part of the callsign, or else the normal country identifier for stations using their home callsign in another DXCC country. For example: N8, W8, AG8, HG7, HG73 are all separate prefixes. The prefix for both N8ABC/KH9 and KH9/N8ABC is KH9. Portable designators without numbers are assumed to have zero after the letter prefix, eg N8ABC/PA becomes N8ABC/PA0. Any calls without numbers are assumed to have a zero after the first two letters, eg RAEM becomes RA0EM. Suffixes indicating maritime mobile, mobile, portable, alternate location, and licence class do not count as prefixes (eg /MM, /M, /P, /A, /E).

SCORING: For each contact score 20 points on 160 m, 10 points on 80 m, 5 points on 40 m, 1 point on 20 m, 2 points on 15 m, and 3 points on 10 m. The score for each band is QSO points for that band times the multiplier for that band. The total score is the sum of the band scores.

LOGS: Use a separate log for each band, with times in UTC. Show new prefix multipliers the first time they are worked. Logs should be checked for duplicates, correct points, and prefix multipliers. Logs must be accompanied by a sorted list of prefix multipliers, and a summary sheet showing callsign, name, address, category, score calculations, and a signed declaration that contest rules and radio regulations were observed. Logs may alternatively be submitted on DOS disk in ASCII format, although the summary sheet must be on paper. Interesting anecdotes, and any comments on the contest are also invited.

SWL LOGS: SWL logs should show date/time, the callsign of the station heard, the callsign of the station being worked, RS(T) and serial number sent by the heard station, points claimed, and new multipliers.

LOG SUBMISSION: Send logs postmarked by 15 November 1993 (SSB) or 22 November 1993 (CW) to: Peter Nesbit VK3APN, VK/ZL/Oceania DX Contest Manager, c/o WIA, Box 300, Caulfield South, Victoria 3162, Australia. Overseas entrants please use airmail. Indicate SSB or CW on envelope.

AWARDS: Special certificates will be awarded to the top scorers on SSB and CW in each category in each prefix area, and on each band for single band entries. Where returns justify, 2nd and 3rd place awards may also be made.

73
Peter VK3APN
**PO Box 300 Caulfield South VIC 3162*
ar

Divisional Notes

Forward Bias — News from the VK1 Division

Chris Davis VK1DO

Locals had a hectic time during July and early August preparing their stations in readiness for the annual Remembrance Day Contest which saw a strong contingent of locals on both HF and VHF. It is always very pleasing to hear various calls, which are conspicuous by their absence throughout the rest of the year, appear over the RD weekend and renew friendships.

The trend among students who are currently attending our courses and classes to attend our monthly meetings is good to see. Many of our students, and indeed novices, seem to have felt disinclined to make an appearance prior to completing their full calls, so I am impressed to see the existing networks of friends and acquaintances moving their networks into contact with the broader amateur community. I hope that with the experience of a year of observing how some of us old hands do things, they will feel inclined to contribute their ideals and energy by nominating for next year's committee. An injection of new ideas and objectives is always beneficial and I personally look forward to the innovation and general breath of fresh air that we might all enjoy from new blood influencing the division at the committee level.

Please note the date for our September general meeting which will be held on Monday September 27th commencing at 8.00 pm in the studio room of the Griffin Centre. Our topic for the September meeting will be a talk by Ian Cowan VK1BG, on Radio Communications and Civil Aviation.

A few months ago I reported to members that I had had some interesting contact with various members who had not been at a monthly meeting for sometime. This contact was brought about by the excessive QSL cards which had accumulated in their name at the office. Many of these old hands were very pleased to see me and have a brief chat; however, many were quick to say that they

would love to get back into the routine of monthly meetings, but they lacked confidence or inclination to go out at night. In my broadcast item I suggested that a few more of the locals check with some of their mates to see whether they were aware of the meeting night and perhaps pool their resources for transport. I suppose I am naive in thinking that people might actually take such an initiative to maintain contact with old friends but I was quite taken aback to hear two locals chatting on FM, one living two suburbs from the other, with one admitting that he had difficulty getting to the meeting these days and the other more mobile member just agreeing with him as to how hard it can be. That was it. No offer of help. Surely we can all do a lot more than that. I know we admit to being eccentric and perhaps even self centred in our pursuits but this total lack of initiative is pathetic. If each person who regularly attends our meeting was to ring two others in relation to the meeting night and prompt their memory or offer transport, our numbers would double.

Please remind your interstate friends about this years Technical Symposium which will be held on Saturday, October 30th at the Southern Cross Primary School in Scullin. Contact personnel for this year's event are Gavin Berger VK1EB on 06-258 5390, and Neil Pickford VK1KNP on 06-258 7803 or 274 8422 at work. Suggestions for topics or other general enquires in relation to the symposium would be welcome.

Drag out that unwanted junk for the October meeting. Our buy and sell trash and treasure night will have numerous keen buyers and sellers with the recent swelling in our local ranks and the long break since our last junk night. Cheers for now.

VK2 Notes

Tim Mills VK2ZTM

Council

During July there were some changes of Council Members. In the election ballot this year there were 12 candidates for the 9 positions. However, two of the successful candidates, Sandy Brucesmith VK2AD and Eric Reimann VK2WH decided not to take up their positions. This left vacancies on Council which were filled by John Simon VK2XGJ and Bob Yorston VK2CAN who were unsuccessful candidates in the ballot. The Council Members and their respective portfolios are:-

Terry Ryeland VK2UX — President, Education Officer & Alt Federal Councillor

John Robinson VK2XY — Vice President, Alt Federal Councillor, Security Officer, QSL Bureau Liaison & Parramatta Property Officer

Roger Harrison VK2ZTB — Vice President, Secretary/Treasurer, Federal Councillor, Membership Officer, Publicity and Advertising

Tim Mills VK2ZTM — Dural Property Officer

Roger Henley VK2ZIG — Member Services

John Simon VK2XGJ — Technical Advisory Liaison and joint Parramatta Property Officer

Julie Kentwell VK2XBR — Joint Publicity and Advertising

Cesar Miranda VK2TCM — NSW Technical Advisory Committee Chairman

Bob Yorston VK2CAN.

Happenings

There is a Trash and Treasure in the Parramatta car park on Sunday afternoon the 26th September....The next and final exams for this year will be conducted by the Division at Amateur Radio House in November....For Sales have been included for Members in the VK2WI broadcast. These can only be accepted by mail or FAX, no packet submissions. If any item is to be repeated it must be resubmitted....A couple of years ago we had a successful round up of 810 valves for the AM transmitters at VK2WI. This time we are looking for 807s for the same transmitters. If you can help please contact the Parramatta office....Please note the early delivery of news items for the broadcast by mail or FAX. Have them arrive by noon Friday so there is time to pass them on for inclusion. Arrangements are being made to FAX material direct to VK2WI. Details later.

New Members

M.B.	(Malcolm)	Brassington	VK2NMB	Merimbula
A.A.	(Angus)	Campbell	VK2YCV	Greenwich
K.G.	(Kingsley)	Forbes-Smith	VK2KFS	Northbridge
J.	(John)	Nolan	Assoc	Kogarah Bay
A.J.	(Tony)	Smith	VK2BTS	South Grafton

VK3 Notes

Barry Wilton VK3XV

Council for 1993-94

All sitting councillors re-nominated to serve for a further term.

Elected councillors are: Jim Linton VK3PC, Barry Wilton VK3XV, Rob Hailey VK3XLZ, Peter Mill VK3ZPP, George Hunt VK3ZNE and Bill Trigg VK3JTW.

It was resolved that councillors continue with their portfolios, and Jim VK3PC was re-elected as president.

Barry VK3XV continues as secretary, Rob VK3XLZ is treasurer, and Peter VK3ZPP is VTAC chairman. George VK3ZNE and Bill VK3JTW are responsible for putting the weekly VK3BWI broadcast to air.

Life Member

Jim VK3PC was granted life membership by the Annual General Meeting in recognition of his long and dedicated service.

Jim has served as president for eight years in the last decade and been responsible for many achievements. He has been prominent in the field of public relations and has been directly responsible for gaining much favourable media coverage for the hobby, and continued to work toward improving Amateur licence conditions and examination, and education services.

New Radio Club

The WIA East Gippsland Zone has, with the approval and assistance of the Victorian Division Council, been disbanded and reconstituted as the East Gippsland Amateur Radio Club. Like other former zones it had difficulty in complying with, and meeting, the cost of new stringent corporate legal requirements. The club will continue to serve local WIA Victoria members, and be the focal point of amateur radio activity in the area.

Club and Zone Net

The regular Sunday night 80 metre on-air meeting known as the Zone and Club Net has been renamed the WIA Victoria Club News Net.

Remembrance Day contest

Did you take part in the Remembrance Day Contest? If the answer is "yes" then make your participation count by submitting a valid entry.

Victoria has won the contest for the past three years because an increasing number of VK3 radio amateurs have submitted entries. As well as submitting your log, encourage your friends to do likewise.

Recruiting Brochure

Following a few "hitches" along the way, the new WIA Victoria publicity brochure has been printed. The fold-out brochure covers many aspects of our hobby and the role of the WIA.

It has been specially prepared to target both existing radio Amateurs who are not currently members of WIA Victoria, and prospective radio amateurs. The professionally designed brochure uses a combination of pictures and text to promote WIA membership and entry into our hobby.

The new publication will be made available to all affiliated radio clubs and selected retail stores within the next few weeks.

ar

How's DX

*Stephen Pall VK2PS**

When you listen on the bands these days the common subject of the discussion is, among others, propagation. Solar flux, A index, K index, T index, words familiar to some and unknown to others, are floating around. Those listeners who are not up-to-date on these subjects are confused. To help you understand these numbers, here is some useful information. Some of it was supplied by the Chatswood, NSW office of the Ionospheric Prediction Service (IPS) Radio and Space Services.

The ten-centimetre solar flux is at a frequency of 2800 MHz (wavelength of 10.7 cm). It is the measurement of the noise the sun emits. Collection of these figures was started shortly after the war, in 1946. The solar flux is a good indicator of the sun's activity. Unlike the sunspot number, the value of the 10 cm flux never drops to zero even during solar minimum. The lowest value to which it drops is approximately 67 which corresponds to the sunspot number zero. The values are quoted daily and are measured by the Ottawa radio observatory.

The magnetic A Index is designed to measure solar particle radiation by its magnetic effects. In other words the index is a measure of the variability ("storminess") of the earth's magnetic field during a 24 hour day. The measurements are from the Fredericksburg Observatory in the USA, and their values are typical of a mid-latitude site. Levels of magnetic disturbance are described in the following terms : 0 up to 7 = Quiet, 8 up to 15 = Unsettled, 16 up to 24 = Active, 25 up to 35 = Minor Storm, 36 and above = Major Storm.

The K Index is a measurement of the maximum disturbance in the earth's magnetic field during a three hour interval. The A Index is calculated from eight three hour figures of the K Index. Both A and K measure the same disturbances but they are presented on different scales. The K Index goes from 0 to 9 and the A Index from 0 to 400. As an example, the K index of 3 is equal to A 15, a K index of 5 is equal to A 48, and a K index of 6 equals A 80. It can be said that the higher the value of the solar flux and the lower the level of the geomagnetic activity (A Index 24 hours, K index every 3 hours) the better are the propagation conditions. Conversely, the lower the solar flux and the higher the geomagnetic activity the poorer will be the conditions.

The Australian T Index is a measure of the average level of the ionospheric critical frequencies available on a particular day. The higher the value of the T Index the higher the ionospheric critical frequencies and Maximum Useable Frequencies (MUF) on HF circuits for that day. The daily T Index is based on data from Australian ionospheric stations and so is most applicable to HF circuits with reflection points in the Australian region.

Mellish Reef VK9M

September 19th to 28th will see the long awaited activity on Mellish Reef. The callsign of the expedition will be released just prior to commencement of the operation. Frequencies to be used are as follows: CW: 1.825, 3.505, 7.025, 10.107, 14.005, 18.077, 21.002, 24.897, 28.445, 50.120. SSB: 1.825, 3.799, 7.123, 14.195, 18.145, 21.295, 24.945, 28.445, 50.120. RTTY: 14.080, 21.080. FM: 29.445. Major support for the expedition came from Dick Smith Electronics which supplied five Yaesu FT-990 transceivers and two FL-7000 amplifiers; and from Emtronics which supplied the T33 tri-band yagi and Coman Antennae with supply of the 20 m monoband Yagi. QSL manager for the expedition is Bill VK4CRR (26 Iron St, Gympie, QLD 4570) and QSLing will commence on December 1st. The expedition will not be able to grant personal skeds. However, with five stations on the air on a 24 hour basis, everybody should have a good chance to work Mellish. Australian novices will have the opportunity to work the expedition on the 80, 15, and 10 metre novice bands.

New French Prefixes

Some time ago the French administration changed the prefixes of its overseas Departments and Territories (see May 93 AR). The mainland French callsign structure now has been changed also. Changes are as follows: FA-no change, FB-no change, FC1 > F1, FD1 > F5, FD6 > F6, FEI > F5, FE2 > F2, FE3 > F3, FE5 > F5, FE6 > F6, FE8 > F8, FE9 > F9, FI > F5, FF (Club stations) > F# KAA-KZZ, CEPT (European Common Licence) > F2 — F9.

IOTA Islands

During the past three to four years "chasing islands" has become very popular among the VK-ZL DX fraternity. The UK based "Islands on the Air" program promotes Dxpeditions working from or to Islands, all of which have been allocated an IOTA reference number, or working from a new island hoping that it will be accepted as a "new" reference number. One could collect 100, 200, 300 or more islands. In the last month there were, among others, two interesting activities from IOTA islands. The Calgary Amateur Radio Association (CARA) activated CH8MNP from Cameron Island (NA-009) from August 18th to 25th. Cameron Island is only about 80 km away from the North Magnetic Pole and lies in CQ Zone 2 in the Canadian Arctic, almost on the edge of the permanent polar ice. The north Magnetic Pole is the point toward which north-seeking compass needles point. This pole can move many kilometres in a few years. QSL to CARA, P0 Box 592, Station M, Calgary, Alberta, T2E 5J6, Canada.

Much further south, off the Thai mainland, the DXpedition led by HS1AAM was very active from 22nd July to the end of that month on all bands from Koh Samet Island (AS-107) which lies 200 km east of Bangkok at 12° 38' N and 101° 27' E. They were active on SSB, CW, RTTY, FM and Packet on five bands. The 15 operators did a very good job of putting the new prefix E22DX and the new island into the IOTA directory. QSL goes to HS1HSJ Viroj Supapak, PO Box 7, Bangkok 10220, Thailand.

Incidentally, if you are looking to work an amateur station near the South Magnetic Pole, then look for Francis FT5YE who can be heard quite regularly with strong signals in VK. He is located at the French antarctic research station in Terre Adelie at the Dumont D'Urville base, 68° 0' S and 140° 0' E. Francis is near the South magnetic pole which also moves as much as 8 kilometres in a year.

Penguin Islands ZS0PI

The Penguin Islands (IOTA AF-055) are a chain of 13 tiny islands which are located along the coast of Namibia (V51) adjacent to the diamond fields, north and south of the Namibian port of Luderitz, and south of Walvis Bay (ZS9). The islands belong to the Republic of South Africa and are administered by the Cape Province of South Africa.

Access to the Penguin Islands is very restricted because the islands are a bird sanctuary and the habitat of many hundreds of thousand of sea birds including some endangered species. But, there are no penguins. The name of the islands is a misnomer. As there is no habitation on Penguin Islands, save a few abandoned guano filled old buildings of a previous era, all the supplies and equipment, generators, fuel, food and drinking water has to be transported to the islands.

The first amateur radio activity on this island group was in July 1990 by a number of German amateurs signing as ZS9A/1 and using also their own callsign with the additional suffix of ZS1. The second activity was in December 1990 when Martti 0H2BH, Wayne N7NG, Pertti 0H2RF and Chris ZS6BCR were operating as ZS9Z/1. The DXAC, after many months of deliberation, accepted Penguin Island as a new DXCC country in May 1991. In December 1991 Chris ZS6BCR and several other operators were active from these islands as ZS0Z. The present activity as ZS0PI is the fourth DXpedition to the islands as far as I know. The activity was from the 24th of July to the 3rd of August. A group of four German operators were active on most of the bands including 80 metres. QSL goes to Helga Kohl, Barkhauer Str 85, D-2300 Kiel 14, Germany.

Future DX Activity

- Mura, ZX0ECF is active from the Brazilian Antarctic Base at Cape Ferraz. QSL to Estacio Antardida Comandat Ferraz, Agencia Correio Satellite, Antardida, 20201/970 Brazil.
- Simon G0GWA is active as 5H3F0E for the next two months. QSL to his home.
- CW enthusiasts please note. There is a possibility that Roger G3SXW will be active this year from Tristan Da Cunha. If the project succeeds the activity will be on all nine HF bands, CW only.
- Chris, D2SA is very active on 14198 kHz at around 0600 and has given VK/ZLs the opportunity to work him. QSL to F6FNU.
- Alan 7Z1AB will be active from Saudi Arabia for the next two years. He is employed by the US Embassy. QSL to KN4F.
- There is a rumour that SP6RT might operate from Libya as 5A0A in October or November.
- Nauru, C2, may be activated by the Desecheo-Navassa DX group next year, around the 23rd of February to the 2nd of March.
- Kim, OZ1ACB is now active in Angola as D2EYE until December.
- Eric, NM5M can be heard as E35M mainly in the CW mode outside his working hours. QSL to home call.

Interesting QSOs and QSL Information

- EX8F — Vlad — 14017 — CW — 0453 — July. QSL to DL6ZFG, Rolf Rahne, PO Box 15, 0-3304, Gommern, Germany.
- HZ1HZ — Ahmed — 14032 — CW — 0419 — July. QSL to N7R0, Dick Moen, 2935 Plymouth Dr, Bellingham, WA 98225, USA
- J28BM — Bob — 14242 — SSB — 0441 — July. QSL to K1SE, William B De Lage, 8597 Burlington Ct Manassas VA 2210 USA
- BT2000BJ — 10105 — CW — 1255 — July. QSL to Rick Niu, Chief Operator, Box 2654 Beijing 100084, Peoples Republic of China.
- VY1JA — Jay — 7027 — CW — 1125 — July. QSL to Jay Parke Allen, RR2 Site 15, Camp 117, Whitehorse, Yukon, Canada.
- PA3CXC/ST0 — John — 18162 — CW — July. QSL to John H Fung Loy, Straussin 4, NL-2551, NM S Gravenhage, The Netherlands.
- E22DX — 21297 — SSB — 0447 — July. QSL to HS1HSJ, Viroj Supapak, PO Box 7, Bangkok 10220, Thailand.
- ZK19HX — Uwe — 14185 — SSB — 0616 — July. QSL to DJ9HX Uwe Jaeger, Eschenstrasse 16, D 7106, Stein A K, Germany.
- OD5ZZ — Walid — 14195 — SSB — 0516 — July. QSL to Walid Karami, Box 782 — Tripoli — Lebanon.
- VK4BRE — Rex — 14222 — SSB — 0624 — July. QSL to Rex East, P0 Box 418, Thursday Island, Torres Strait, QLD 4875 Australia.

From Here There and Everywhere

- Sid, VK2DID reports that VP8GAV is located at Faraday Base, Argentine Island, off the Antarctic Peninsula at 65° 15' S and 64° 16' W. The QSL manager is David, GM0LVI.
- If you are chasing DX on 40 metres listen into Nicola's net on 7070 kHz at around 2000 to 2200 UTC. Kerry, VK4MZ is also around there most of the days.
- VR6BB was active on Pitcairn Island in the beginning of the year. His QSL manager is JF2KOZ. Many VKs are waiting on the card. Here is his address again: Yuji Miura, 7-3, Yanagigaoka, Room 101, Main-Haitsu, Tahara, Atsumi, Aichi, 441-34, Japan.
- The Peter I Island DXpedition is progressing slowly. They will sail from Falkland Island on January 23, 1993 in an icebreaker and intend to stay on the island for 16 days.
- ZK19HX was heard during the IOTA Contest from South Cook Islands.
- The traditional "Frontier" meeting of amateurs from Hungary, Austria, Slovakia, the Czech Republic and others from Europe will take place on September 10-12 in the City of Sopron on the Hungarian-Austrian border.
- 409W is operating from Belgrade. QSL to YU1EXY.
- No further news about Romeo in Libya. Wild, unconfirmed rumour says he is in jail in Libya.
- 9K2JC wants his QSLs to the Bureau or c/o Canadian Embassy, Box 25281, Kuwait City, Kuwait.
- Kim, HL93A/P2 was on Jebu island. QSL to HLIXP.
- 5Z4BI is leaving Kenya at the end of September.
- As we reported some time ago, as from the 1st of July 1993 the German postal

Help stamp out stolen equipment. Keep a record of all your equipment serial numbers in a safe place.

codes (Zip code) now contain five digit numbers.

- According to the "DX News Sheet", Minoru JA3MNP has been invited by the monk Apollo SV2ASP/A, together with SV2WT, for one week personal visit to Mount Athos (no amateur activity). Minori will present Apollo with an IC-750 and RTTY equipment as a gift and might demonstrate the equipment if so desired.
- French postal rates changed on 5th of July, but one IRC or one "green stamp" still covers a 20 gm air mail letter anywhere in the world.
- VR2EK is Dave, operating from Hong Kong on 40 — 10 metres, both SSB and CW. QSL to G3AUA.
- DK0WCY is a beacon on 10.144 kHz. Good for checking European propagation.
- If you missed the last St Paul Island activity, the second operation with the call CY9CWI concluded around the 18th of August. QSL to PO Box 884, Pointe-Claire/Dorval QC Canada, H9R 4Z6.
- In the first 6 months of the year the ARRL outgoing bureau has mailed 1,183,060 QSL cards.
- The Natal DX Group, a Brazilian Amateur DX Group, is planning a DXpedition to St Peter & Paul Rocks (PY0S) in January or February 1994.
- Franco I4LCK, who was on Ibo Island (IOTA AF-061) as C9LCK/P, has operated as 3D2CK/P from Matagi Island (0C-16) from 8th to 12th August and from Yavu Island in the Ringgold Group from the 14th to the 22nd August.
- Mike, N9NS the leader of the Kingman Reef/Palmyra DXpedition (KH5), sent me more details and a photograph (see front cover of this issue) dealing with the days on that reef. Here is part of his letter (see also May and June AR). Kingman Reef is a triangular shaped atoll located 1000 miles south from Honolulu, Hawaii. It measures about 6 miles on one side and it is completely submerged except for an 800 foot long gravel bar near the south-east point. This bar averages 10 to 20 feet in width and rises about six feet above mean sea level. The Palmyra Islands lie about 35 miles to the south-east of Kingman. The transport and logistic difficulties, which were beyond the control of the expeditioners, are well known. Six operators started the activity at 0400 UTC on March 11. A few days later two operators were transported to Palmyra, the other four to Kingman. Last contact from Kingman was made at 2035 UTC on March the 15th after nearly 24000 QSOs. The Palmyra group made about 9000 contacts in four days. Mike apologies for being late with QSLing. He has, so far, 15000 cards to reply to. There were "maddening" delays in producing the cards but by the time you read this the cards are probably with the printer. He is asking for patience and understanding.

QSLs Received

S52FB (2W 0P) — 5XIXX (2M K7UP) — 5XIXT (9W WF5T) — T94CR (7W SM5AQD) — AH1A (5M MHDXA/K1ER) — C9LCK (10 W I4LCK).

Thank You

This column would not have been possible without the input of the following contributors: VK2DID, VK2KFU, VK3DD, VK4DA, VK4CRR, VK4CY, VK4OH, VK4OD, VK5WO, I4LCK, N9NS and the following publications: QRZ DZ, The DX Bulletin, and the DX New Sheet.

Good DX and 73

PO Box 93 DURAL NSW 2158

ar

Education Notes

*Brenda M Edmonds VK3KT**

I recently received a letter from a member of the RSGB Training and Education Committee, asking for information about amateur radio training, education and examinations in Australia, and providing information about some of the schemes being developed in the UK. It included a list of over 30 schools with active amateur radio clubs or with staff or students participating in radio type activities.

The RSGB is currently running Project Year, "Youth into Electronics via Amateur Radio" which, while aimed at beginners of all ages, has placed strong emphasis on activities which will attract youngsters into the hobby. The recent establishment of a Novice level licence in the UK has apparently been very successful, with a large number of Novices already active both individually and within clubs or schools. The RSGB Journal, "Radcom", gives good publicity to such activities, and also produces a separate publication, "Do-it-Yourself Radio", specifically for beginners.

The letter also enclosed a copy of a circular from the IARU, Region 1, seeking information on the involvement of schools, teachers and students in amateur radio related activities, and ways in which amateur radio can be used within the normal educational system. This information will be collated with a view to assessing the educational impact of amateur radio within Region 1, and providing reports to participants to allow them to share ideas and projects.

For some years I have been trying to collect this type of information, but with little success. I do know of a few teachers and schools who are very active in the training and operation of amateur radio stations, and from what I have heard some of them are doing a fantastic job (Maggie, when do we get that report of your big function?). But now that I am no longer directly involved in schools I find it harder to keep my information up-to-date.

Perhaps this would be a good time to try to update what information I do have, and extend it. I would be very pleased to be able to send the RSGB and the IARU a full report of what is happening in this country, and receive their reports in turn. How about all you active teachers, or students, dropping me a short note to say what you are doing, who is leading or helping, the successes you have had, and the ideas you have in mind. If you like to prepare a short "This is how we do/did it" item, I will be very pleased to include it in these notes to share the ideas and encourage the newcomers. I know there is an enormous amount of talent and enthusiasm out there, and many members would like to read about it. Some may even be stirred to offer further help.

Perhaps, also, this could be a start for a scheme in Region 3 similar to that in Region 1. There is already a small group of enthusiasts working on ways to introduce amateur radio to the developing countries of the Pacific area, but it seems to be moving fairly slowly, and making few reports. There are also moves towards the establishment of a single licence scheme for the countries of the Pacific Rim.

I look forward to receiving a veritable flood of information in the near future. I thank you all in advance for your enthusiastic responses.

73

Brenda VK3KT

**WIA Federal Education Co-ordinator*
PO Box 445 Blackburn VIC 3130

ar

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (the Spectrum Management Agency in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Below is a recently logged list of intruders into the amateur bands:-

Summary of Illegal Intrusions for June 1993

FREQ	DATE	UTC	MODE	COMMENTS	"X"
3588.5	240693	1250	PON	6 kHz wide	
3623.4	0606	1310	non	non amateur tones 6kHz wide	
7002.5	2105	mni	A1A	V Beacon CIS	21
7000.72	2706	1245	J3E	Group,for lang,2way,no c/s	3
7013.5+	2906	1139	R7B	Very broad	8
7022/24	2506	1320	NON	Also F1B,STN SHIFTS	
7039.5	2106	1120	A1A	Beacons,H F S N K R 98BD,CIS	40
7052.2	2406	1250	NON		
7055.5	1106	1100	MXD	PON,F1cw,F7B	
7064.5	2606	1128	F1B		
7070.5	2906	0830	F1B	3 kHz Shift	
7085	050693	1050	A3E	B/c,R.Bangladesh??Home service	
7093	2606	1200	MXD	Bursts,F1B Rev,FSK Tfc	
1012.5	2306	2142	R7B		
10115	2306	2145	A3C	WX FAX daily	30
10125	2006	2250	A3E	Fem voice,c/s VLB 2	
10133	1906	2250	A2A	VHP mcw A13 B[?]	
14061.5	220593	0645+	MNI	PON,A3C,A1A,F7B.	37
14070.5	2406	0720	A3C	FAX Drum speed 120 +F1B ry's	
14072.3	2706	1220	A3C	FAX " " 120 RPM	
14073.5	2606	0709	F1B		
14075	2506	0830	F1B	Also F3C	
14078	250693	0600	A3C	FAX 120 rpm drum speed	
14093	3006	0445	F1B	RTTY 4kHz shift	
14095	0406	1110	F7B		
14114.5	2106	0415	A2A	2 & 3 LTR groups mcw	25
14142.5	2105	0640	R7B	Sev chan,H 24 stn 5kHz wide	8
14170.5	2105	0750	F1B	MNR,UMS group,250 Hz CIS	30
14210	2205	1040	A3E	2 F of 7105 kHz Taiwan ?	6
14338.5	0906	2140	A3C	Daily Wx Fax	30
18090	210693	0843	R7B		
18100.5	1206	0515	—	149 Baud Sync	
18135	0406	1050	A3E	Weak b/c stn music	
18137	1306	0520	F2B	Piccolo	
21113	mni	0550+	A1A	C/S P7A	10
21324	0806	0522	A1A	C/s VVH	
24894	1206	0638	A1A	Marine radio cw tfc,non amateur	
24965	150693	0847	A3J	Fem voice,synthetic,updating data,eg,GA03,GA05,QL 20&C	

Random Frequencies needing further checking: 21001, 21005, 14125.5-1429 B9W, 4 kHz w from 0545/0940 z; 14156 to 14162.5 at 1055 z 14176.5 F1B, 1050 z, 250 Hz, no ID to date.

All non modes need checking at random times for possible callsigns.
Hint: R7B sounds like a large circular saw and B9W sounds like a distant jet engine.
My thanks this month to VKs 2GS, 4AGL, 4AKX, 4BXC, 4BTW, 4JJS, 5TL, 6RO.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

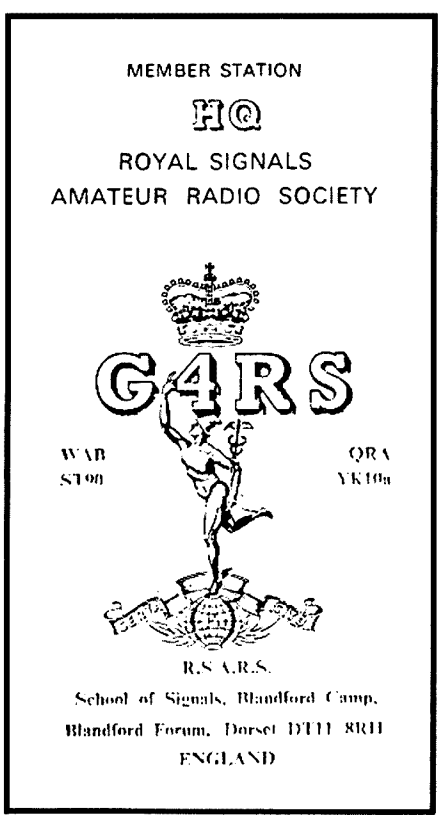
ar

QSLs from the WIA Collection

*Ken Matchett VK3TL**

The Royal Corps of Signals

Success in modern warfare depends considerably upon the standard of communication between one's forces. Before the 19th century, weapons and ammunition were of such a relatively poor standard that bugle and trumpet sufficed as short range control signals. As musketry and cannon increased their range, communication over a much greater distance became necessary since the fall of shot could no longer be observed from the gun lines. After an extensive period during which heliographs and flags were used, Morse telegraphy came to revolutionise the art of communication. The perfection of this mode of communication, together with the development of signal telegraphy, corresponded with the growth of amateur radio activity and wireless experimentation. The successes of the Allied Forces during World War 2 were due, in no small amount, to the pool of radio amateurs available for service in signal units of the Navy, Army and Air Force. It is not surprising, then, that signallers from many countries have formed numerous radio clubs brought together with a shared love of amateur radio.



G4RS

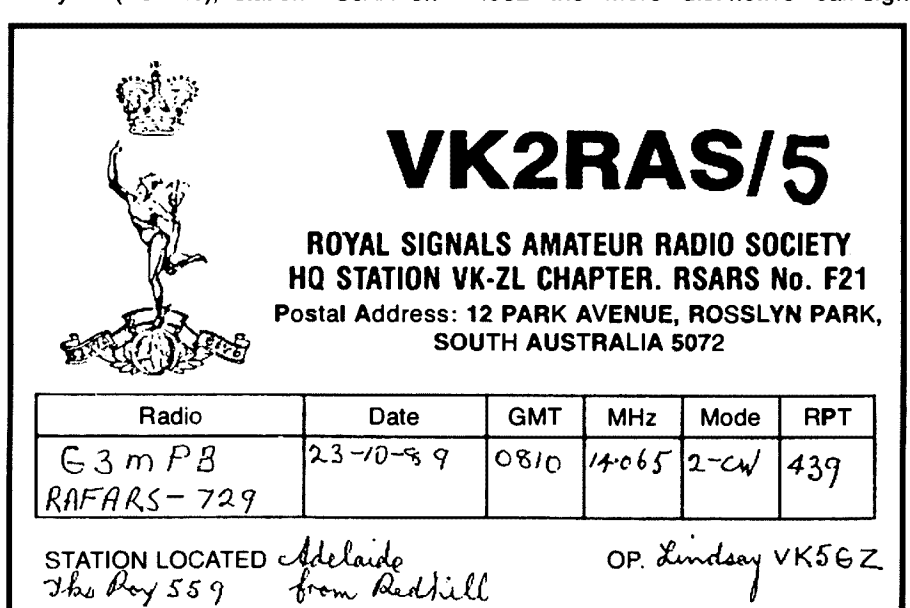
The Royal Corps of Signals is one of the world's oldest communication organisations. It was formed in the year 1920 taking over the task of armed forces communications from the Royal Engineers. A special issue QSL, GB70SIG celebrated on 28th June 1990, the 70th anniversary of the formation of the Royal Corps of Signals. Operation was from the Signals Training Centre, Scarborough. Another special issue QSL was GB0RSR which celebrated the Royal Signals Reunion at Catterick. The QSL shown, G4RS, with its appropriate suffix, is the HQ station of the Royal Signals Amateur Radio Society (RSARS) at Catterick Garrison in North Yorkshire. It will be seen that the logo of the Corps of Signals displays the Greek God, Hermes (Roman God, Mercury), the messenger of the Gods. He wears on his head the petesus or felt cap worn by travellers and holds the caduceus or herald's staff in his left hand. He stands above the world globe about which is a scroll with the motto "Certa Cito" (Sure Swift). Above his head is the Royal crown.

Many readers will be familiar with the QSLs of RSARS members who display this logo and, like the members of the Royal Navy Amateur Radio Society, (see AR Feb, April, June 1993) proudly indicate their membership number on the card. Such QSLs emanate from all corners of the globe. The call 9M2CF is that of the Armed Forces Signal Regiment in Malaysia (No 210), station VS6AA on Hong Kong Island (No 282), Station VK3NQ (No 1614), ZL1AXM (No 530), and NT2R in New York (No 883) to name just a few.

VK2RAS/5

The development of a signal Corps in Australia follows closely that of its British counterpart. As early as 1885 a "Signalling Corps" was formed in South Australia and even before that date (in 1869) there had been established what was known as the "Torpedo and Signal Corps" in Victoria and NSW. In fact it can be said that Australia has the distinction of having the first regularly-formed signal unit in the British Empire. Like the British Corps of Signals, our own signals corps was, in its infancy, attached to the Engineers. However, it became a separate entity in 1920 known as the Corps of Signals, and five years later as the Australian Corps of Signals. (It wasn't until 1948 that King George VI granted the title "Royal Australian Corps of Signals"). At the same time this body became affiliated with the Royal Corps of Signals of the British Army. From modest beginnings, the Corps grew in numbers until during World War 2 no fewer than 24,000 men and women had joined its ranks. The logo of the Royal Australian Corps of Signals (RASIGS) is the same as that of the Royal Corps of Signals with the exception that beneath the globe upon which Hermes stands is a boomerang bearing the word "Australia".

The VK/ZL Chapter of the RSARS was formed around 1980 by Rob VK1ARL and Les VK2NLE. The Chapter used the call VK2DRS, contacts being made with RSARS members in Great Britain, but in 1982 the more distinctive call-sign



VK2RAS was granted by the authorities. This call has been used extensively operating portable in the various Australian States, particularly South Australia. The station manager of VK2RAS/5 is Lindsay VK5GZ to whom the author is grateful for supplying both QSL cards and information about the VK/ZL chapter. The club secretary Ken VK5AL will also assist in membership enquiries. Regular skeds are conducted on 3.615 MHz at 1030 z on Wednesday evenings whilst a world-wide SSB net is conducted on 14.153 MHz on Saturdays at 0600 z. The CW net working frequency is 14.065 MHz. There have been several stations on the air associated with signals before the formation of the VK/ZL Chapter of the RSARS. The commemorative station AX3SIG operated during 1975 from the Signals Depot, Watsonia Barracks. This call celebrated the Royal Australian Corps of Signals 1925-1975 Jubilee. Station VK3ASR of the Royal Australian Corps of Signals operated from just after World War 2 until the 1980s. The Royal Australian Signals Association of NSW operated VK2AIF during the 1970s, and the call VK7SR was the call issued to the Army Signals Radio Club in Tasmania in the 1950s.

Of course the Army is not the only Force with which we associate signalling. Even before World War 2 there were many amateurs who were proud members of the Royal Australian Air Force Wireless Reserve. Several of these made mention of this fact upon their QSL cards. The RAAF Wireless Reserve, which played such an important role in providing a pool of well-trained wireless operators for the RAAF during the war, was the brain child of Howard Kingsley Love, one time President of the WIA and founder of the well known firm, Kingsley Radio. At that time, he was a Fit Lt in the Citizens Air Force based at Laverton. It is interesting to note that radio control was effected by the WIA's own transmitter, VK3WI, then located at the Essendon Aerodrome.

PI1VKL

The interest shown in signalling is not confined to those radio operators of Great Britain and Australia. The QSL shown, PI1VKL is a specially assigned call of the Royal Netherlands Army Signal Corps at Utrecht. (The prefix PI rather than the usual PA is assigned mainly to radio clubs, schools and maritime mobile operations). Quite a few other countries have special prefixes or call-sign suffixes. The Indonesian Station YE3C was a special station of the Indonesian Army Signals Corps transmitting from Surabaya, East Java celebrating its 40th anniversary (in 1985). The HB4 prefix has

only been used a few times. The Swiss Army Signal corps used the call HB4FB during its National Field Day in 1961. The Norwegian call sign LA2J is the club station of Army signals. One of the most interesting QSLs in the WIA collection is J2AHI in Japan. This call, issued before the allocation of the JA prefixes, belonged to Major Lloyd Colvin of the US Army of Occupation Signal Corps in 1948 long before he became world famous as a DXpeditioner. Yet another special call to be found is that of SL5AX, the Signal Training Centre of the Royal Swedish Navy. (The prefixes SL and SK are special calls issued to mainly military installations permitted to operate in the amateur bands).

Apart from special calls, there have been numerous calls on the air from all over the world which have been associated with signal training organisations and clubs, eg:
AP5HQ the Command Training Centre in Pakistan,
VU2SS School of Signals at Mhow, India,
EI5C Signals Radio Club in county Kildare, Ireland,
VS5CS Signals Club Brunei,
HL9US Signals Section of the 8th US Army in Seoul,
ZB2B the Rock Wireless Station on Gibralter,
ZB1AC Army Signals Malta Force
9M2XX the Gurkha Signal Regt in West Malaysia,
to name just a few. Special mention should be made of the US Army Signal Corps. DX operators will be aware of the numerous signal stations both on the US mainland and in US possessions in the Pacific. What might not be so well known is the close liaison on an official basis between the US Signal Corps and the amateur administrative body, the ARRL. The public service value of radio amateurs during the First World War was realised to such an extent that the US War Department itself, soon after the Armistice, initiated plans for the establishment of an Army Amateur Radio Service (AARS). Under this plan the ARRL undertook to assist in organising and promoting the AARS as a reservoir of trained radio operators. The plan took effect on 1st November 1925 resulting in a valuable nucleus of signal officers and men when America entered the War in 1941. *(It continued post-war with all services as the Military Affiliated Radio Service [MARS] Ed.)*

Authors' Note

The WIA QSL collection is still in need of QSLs. Could you make a donation? Of special value are rare DX, special prefixes and commemorative QSLs. Please contact the author of this series of articles, who is also the Honorary Curator.

Thanks

The WIA would like to thank the following for their kind donation of QSLs to the WIA collection:- (supplementary list)
Alan VK3CD Chas VK3QY Fred VK4RF Robin VK6LK Lindsay VK5GZ Jim VK7WR Lindsay VK3LFA John G3BDQ Jim VK1FF Norm VK4KO (courtesy Archie VK3LAB).

Also to the family and friends of the following "silent keys": (supplementary list)
Charlie Davey VK3WT (courtesy of Tony VK3ZMP)
Harold Wright VK2AWH/VK0WH (courtesy of Bill VK2WJC)
Joe Ackerman VK4AIX (courtesy of Norman VK4NN).

4 Sunrise Hill Road Montrose VIC 3765
Tel: 03 728 5350
ar

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

F H	ARMANASCO	L60370
L W (Leslie)	COLLINS	VK2PBY
I G (Irene)	WILSON	VK5CKP
J E (John)	LAMPREY	VK5JL

James Creswell (Cress) Clarke VK4AK

We report with regret the passing of a fine teacher musician, dedicated ham and comrade-in-arms at his home in Bracken Ridge, Brisbane, on 25th May 1993, at the age of 74.

After his discharge from the RAAF at the end of the war Cress was licensed as VK2AYB at Wentworthville, NSW where he spent many happy years with his wife, Mary, raising their family.

For a time he was President of the Wentworthville RSL and was also President of the Bowling Club.

Cress joined the RAAF in 1941 and trained as a wireless maintenance mechanic to become an original member of No. 30 Beaufort Squadron formed in July 1942. He served at Port Moresby, Milne Bay, Goodenough Island and the Trobriands, returning to Australia in January 1944 to take up experimental work at RAAF HQ.

Before leaving NSW. Cress took up the call VK2CC. When he and Mary moved to Brisbane in 1988 the VK2CC call went to the Royal Naval Amateur Radio Society and Cress became VK4AK.

Because of his association with Radar personnel during the war, Cress was accepted as an associate member of the RAAF Radar Net.

Cress has always been very close to his family, particularly the grandchildren. Most of the immediate family now live in Brisbane.

As the minister of the Bracken Ridge Uniting Church said...." He was just the sort of bloke we can't afford to lose."

Bill VK4UB and John VK4MX for the Radar Group

Ian Yule ZL1ABK

Ian Yule passed away at his home on 4th August 1993. Ian was a keen yachting enthusiast and would be well known to amateurs throughout Australia and New Zealand.

Ian, who returned to New Zealand some years ago, was a founding member of the Western and Northern Suburbs Amateur Radio Club which was established in the late 1970s. Ian was a former president of the Club and, with others, was untiring in his efforts over a number of years to establish and maintain a club in Melbourne's northern suburbs. Ian's callsign at that time was VK3ANZ.

David Hunt, Spectrum Management Agency

ar

Pounding Brass

*Stephen P Smith VK2SPS**

The intended two part series on Samuel F B Morse will appear in later issues. This month we will look at learning the Morse code.

Over the years there have been various teaching methods and practices for people interested in learning Morse code. Some of these methods were good, others not so good. I recall the method I was taught many years ago (outlined here) and the E I S H 5 method from the Marconi school of Wireless (will appear in a later issue).

Before learning the code I would like to raise this important point — to complete a Morse code course successfully will depend on how you apply yourself. For example, set yourself an objective, say 15 to 30 minutes per night, and stick to it. If you follow this rule you will become the master not the slave to Morse code. Remember the old saying "practice makes perfect". There are no magic recipes which will qualify you as a brasspounder overnight. There are a number of tips and techniques which can make the job easier, but ultimately it is up to you.

When Samuel Morse invented his code, he had no idea anyone would ever be trying to copy dits and dahs from wireless transmission. In the first place, the code was devised for use on the land-line telegraph. In the second place, the intention was for the signals to be transcribed onto a paper tape by a swinging pen and then read by sight. Once operators learned the code they quickly found that they could recognise incoming characters by the clicks the pen made, and it wasn't long before they realised that it was actually easier, so the pen gave way to the sounder.

The Morse code consists of patterns of short sounds and long sounds, interspersed with spaces. Forget you ever heard of dots and dashes (at least until you have learned the Morse code) and think of the short sounds as "dits" and the long sounds as "dahs". This gives you a useful way to represent the sound of the code any time you want — your own voice. Here, already, is your first secret technique to help make the job easier — now that you know how to say a Morse code letter by using dits and dahs! What you are really interested in is the sound of the letter.

For example, when you hear the sound "di-di-dit" you should recognise the sound as representing the letter S. You should not count the dits. Take a more difficult one now — "di-di-dah-dit". Say it over and over to yourself until you recognise the sound of an F without having to think of it in terms of a bunch of dits with a dah towards the end.

The sound of dits is written without the t (except for the last one) for a very good reason — they have to be said quickly, and you can't manage that if you say "dit — dit — dah — dit...di-di-dah-dit". You should now be ready to learn another secret technique, which is speed.

You should learn the characters at speed high enough that they sound like Morse characters, not individual dits and dahs. While you are learning the code, the character speed should be eight to ten words a minute with extra space in between the characters to slow the message speed down to something you can handle. This is called proportional spacing. When I was introduced to the code for the first time I heard the letter S sent at a speed of fifty words a minute. Just once, all by itself. Most people can recognise it without difficulty. This proves that there is no problem in hearing code characters and remembering them, the problem is in converting them into letters.

You should by now be ready to start learning the code. You've had all the tools you need since the day you were born. It is simply a matter of applying them (and yourself) to the task at hand.

Ideally you should listen to pure audio tones, such as those sent over the air by a good practice oscillator driven by a competent operator. You certainly can learn the code characters by saying them to yourself all day long, without benefit of an instructor or tapes, but there are easier

ways. If you can get someone to send to you, have them send at a character speed of 8 — 10 wpm, spaced out so they send a character every three or four seconds. This gives you plenty of time to recognise the character, but not enough time to mentally go through the whole alphabet until you locate it.

You need a program for learning the characters, so I would suggest the following groups, which give you easy letters mixed with hard ones so you are not tripped up by Qs, Js, Xs and Zs which you would probably have put off till last.

AXSET HBDIJ OPQRM ZCGNV UYLKWF 12345 67890.

Learn each group thoroughly on its own then add it to the letters already learned, then make up words using the letters learned. Leave the numbers until you have mastered the letters, and you will find them a lot easier. Do not go on to the next group until you have mastered all of the letters learned so far.

You can get a lot of practice in by writing the group you are studying on a bit of paper (writing dits and dahs of course, not dots and dashes) and glancing at it while on the bus, or at work or whenever you have two minutes to yourself.

Once you have learned the first group, you can start listening to practice tapes and the slow Morse broadcasts. Just worry about picking out the letters you recognise and form a good habit now. If you miss a letter forget it and concentrate on the next one. If you strain too hard to remember a letter, you will miss the next several letters and that's a circumstance which could cost you a pass in the exam.

Once you have learned the code, it's just a matter of getting your speed up to the required level (or level you desire, which should be higher than the required level). The only way to get your speed up is to practice, whether it's listening to tapes or live code on air, having a friend send to you, or calling out licence plates from passing cars.

Next month I'll give you some more ideas for practice and getting you up as fast as you want to go. Till then, 73.

PO Box 361 Mona Vale NSW 2103

ar

Repeater Link

*with Will McGhie VK6UU**

FM828

Reference to a manual put together by Alan (Mac) Mc Kinnon VK5AM on conversion of the Philips FM 828 to Amateur repeater service, has resulted in a flood of requests from Amateurs to the Port Augusta Amateur Radio Club. As the manual was only put together as a record of the conversion process, copies are not available off the shelf, and there is a small cost involved to reproduce the information. Alan VK5BWG is prepared to supply the requests for the manual if he is supplied with an A4 size envelope, and six 45 cent stamps to cover postage and copying costs. For those who have requested a copy please send the above, and in time Alan will endeavour to send the information to you. Alan also mentioned that Mac VK5AM passed away in 1992 and will be sadly missed not only for his technical know-how but his friendly and cheerful attitude to all those who knew him.

VK3DRB Stateside

A packet bulletin I read a couple of months ago was, to me anyway, so interesting that it is worth reproducing in Repeater Link. It chronicles David VK3DRB's travels through parts of America. The article is interesting reading from a general ham point of view and also from his experiences with repeaters that do just that little bit more. For example a repeater, that if you time out on, tells the listeners so, then cocks a gun and fires 3 times. A bit of fun in the sometimes serious business of amateur radio. I contacted David via Packet Radio and he gave me permission to reproduce his article.

Hamming in Texas — by David Byrne, W5/VK3DRB

I have just returned from a seven month IBM assignment in Austin, Texas. It was a great experience for myself as well as my wife and three children. On weekends and vacation, we managed to travel as far south as Mexico and north to Oklahoma. I bought a little FT-23 from VK2CXC just before I left. It was without question the most useful thing we brought with us, next to the passports and visas!

Not only was it a medium in which to meet many of the local Austin hams, but it was also an excellent road map and telephone! We visited many cities, including Houston (went to a BIG hamfest there — silver plated PL259s with teflon dielectric for $US 1 each! 2 kW baluns for $US 10!), Dallas, Fort Worth, Arlington, San Antonio, Waco (y'all heard of Waco, eh!), Fredricksburg, Johnson City, San Marcos and a number of others. I never used a road map outside Austin. Whenever a Texan heard a VK asking for assistance on the 2 m, it was GUARANTEED someone would come back and assist straight away. In fact, a ham in Dallas gave us a one day tour of Dallas and Fort Worth by radio. It was indeed a joy to meet him at the end of the day at a hamburger restaurant.

Austin is a unique city in the world and has a population of only 400,000 people. It is arguably the folk music capital of the world. It is also very high tech, with the huge plants of IBM, Motorola, Texas Instruments, MCC, Dell Computers, Abbott Labs and others. It boasts three big universities and has the highest average education standard for any city in the USA. The people are most friendly, in stark contrast to New York and LA. Also, there are many excellent Tex-Mex restaurants there. Ever tried eating a raw Jalapeno whilst having a QSO on 2 m? The standard of living is high, and my home QTH 1974 HQ rust bucket would stick out like a sore toe amongst the Corvettes and RX-7s. Mind you, even my HQ would liken to the $US 1.02 per gallon of gasoline. (Most all Texas oil is imported too. So much for our World Parity Pricing of 72.5 cents per litre in Wangaratta.) One downer about Austin, however, are their 4 way stop signs — don't hold a mike as you approach one of those!

In Austin, there are many repeaters, some of which have phone patch facilities. I bought a $15 Tandy touch tone encoder for the FT-23 to activate all the repeater facilities. I could telephone my wife from Austin or surrounding towns from the car using the 2 m rig (local calls are free in Austin.) I could even ask my wife what was it she wanted me to buy once I reached the store and forgot as usual. Mind you, phone patch there is respected and not abused. The maximum length of a call was about 5 minutes. Many of the repeaters are privately funded. An IBMer W5EBJ owns 4 of the best repeaters I have ever heard. On his 147.180 repeater, you can enter a code and the repeater advises you in a "digitised" voice your FM deviation, transmit frequency accuracy and signal strength into the repeater. If the PTT button is inadvertently pressed momentarily, the repeater responds with a "Good afternoon, this is W5EBJ's repeater. The time is..." and a female voice says the time and date. There is another repeater on 145.210. Not a bad repeater, but what makes it unique is that is has a 10 metre FM link. For this reason, I will be purchasing an FM board for my FT-747 so I can contact some 2 m friends in Austin when conditions permit. This link is switched in for about 12 hours a day, and a 70 cm link is switched in for the other 12 hours.

My favourite repeater was W5FQR's 146.880 repeater. The repeater was easily accessible from my apartment and had a

good phone patch. One repeater in Austin has a unique feature where, if you time-out, the repeater says you have timed-out, cocks a gun, and fires three bullets. My family exploded into laughter when I timed out that repeater.

Most Texas repeaters are on towers, some as high as 1500 feet. I saw a few of these towers and I started dreaming about owning a 1500 foot tower of my own (keep on dreamin', buster.)

One of the big interests in the Austin Amateur Radio Club is fast scan TV. Many of the hams engage in emergency communications drills and have a good relationship with the local police force. One of the 50 cable television stations we had was the local weather channel. During violent storms, hams would radio in a net and give accurate details on how the storm was progressing at their location. This information is fed back to the TV station. Tuning in around 162.400 MHz, I could hear the audio for these local weather forecasts anywhere in the USA. In Texas, they are dead accurate with their forecasts, too!

We got a buzz when we visited Gary N5PHT with whom I had a weekly sked on 20 m for 4 months before visiting Texas. We visited each other's families many times whilst we were there. Gary is a great guy, and can often be found on 14.200 MHz.

Dave N5RNE informed me that a personalised car registration number plate for Amateur Radio Operators costs $1 per year! These number plates are really nice, with the call sign in big blue letters with a white background. In smaller letters are the words "Texas Radio Operator". The reasoning behind this is that a ham can easily be identified in the event of emergency, and also as recognition by the Texas state authorities of the amateur radio hobby. In the state of Victoria it costs several hundred dollars ($295 Ed) for us to have such a number plate. An example of the different mentalities. However, I will be lobbying for "complimentary" amateur radio licence plates to be introduced in Victoria to licensed hams only. Any comments, please send to VK3DRB@ VK3EEE on packet radio.

All in all it was a very successful trip. Austin and its people were fabulous and many friendships will continue for years to come. I met many hams whilst there, and our 7 am weekly breakfast meeting at the Arboretum will be missed. I thoroughly recommend anyone travelling to the US to get a reciprocal licence from the FCC, submitting the application 3 months in advance. Gary N5PHT helped me get mine, and it was all well worth the effort.

21 Waterloo Cr Lesmurdie 6076 VK6UU@VK6BBS

ar

WICEN

Report on WICEN/NTES exercise

Introduction

WICEN and the NT Emergency Service held a joint exercise on Saturday 1st May 1993 at a location 100 km along the Arnhem Highway from Darwin. The scope of this exercise was limited to providing rear link communications from the Forward Operations Centre (FOC) back to Darwin, a distance of approx 50 km as the crow flies.

Packet radio has, in the past, been used by only a few amateurs in Darwin. With the appearance of cheaper TNCs on the market and the gradual acceptance of data communications, more have taken up this aspect of the hobby. All experience to date has been from established stations at home QTHs. In an attempt to build a base of portable packet experience, it was decided to use it as a secondary method of passing messages after HF.

The Geography

Darwin and immediate surrounding areas suffer from a lack of many things, one of which is mountains, or even hills resembling mountains, which are not conducive to VHF communications. The highest points in Darwin are water towers with an occasional high-rise in the CBD. The challenge was to find a suitable hill with an access road and obtain permission to place a digipeater here.

The location of the exercise was a police youth camp situated near Mt Bundy on the Arnhem Highway east of Darwin on the way to Kakadu. The country is generally flat with light to medium scrub and tree height to 10 metres.

Equipment

As can be imagined, the equipment used came straight from the shack and was not designed to be used in an unfriendly environment. The base radio consisted of an MFJ 1278 and 35 watts.

A digipeater on the Noonamah Tower consisted of an FM-828 and MFJ-1272 TNC. Antenna height was 25 metres. Another portable digipeater was a PK-232 and Yaesu Tx with a beam antenna.

The FOC was in a campervan using a laptop and Baycom modem to a hand-held on a Slim Jim antenna.

Conduct

Once in position we established comms on HF (7 and 10 MHz). Propagation was excellent and comms were loud and clear. While this was occurring, a mobile team was setting up the digipeater link on Mt Bundy. This involved a 4-wheel drive up a fairly steep road for a couple of kms.

This circuit consisted of:

FOC

Digipeat from Mt Bundy (2 km away), to Digipeater on Noonamah Tower (80 km), to

Darwin (50 km).

The operation of the HF net presented no problems, the traffic being low density. Working off a car battery initially produced a bit of FM because of the length of DC lead required. Cutting back the power fixed this with no effect on the quality of comms.

The packet link had a few teething problems.

The digipeater equipment belonged to someone else thereby introducing unfamiliarity. When first installed it worked and packets were passed to Darwin but a faulty mic lead forced field repairs and when re-assembled, the squelch setting was set too fine and kept opening. This was not recognised as all the other TNCs ran open squelch. The TNC thought the net was occupied and refused to pass packets.

Thinking the TNC (PK-232) was faulty, the vehicle was sent back again and a station operated from the vehicle. This was successful and messages passed through the digipeaters to Darwin. Much (unjustified) cursing of PK-232s occurred. An engineering channel is necessary so as to avoid technical traffic going over the operational net. The packet frequency was used in this instance but a UHF channel would have been better.

The format for packet messages was:

Msg Nr 01/01	The OUT msg number
R	Precedence
0109001K MAY 93	Date/Time group
OPS 21	Orig No
FM	
TO	
BT	
Text	
BT	
EOM	End of message
K or AR	

This format is similar to that proposed for RTTY many years ago and, as anticipated, proved to be a quick and simple format.

The Emergency Service was conducting navigation practice but, due to their handhelds becoming unserviceable, the exercise was terminated at 1300 hrs and so the expected amount of message handling did not occur.

Problems Identified

1. AC power was taken from the NTES generator. During the day it was noted that our AC adaptors were running excessively hot. Upon checking the AC volts, it was discovered that the gen set was producing 300 VAC. We started and switched over to our own gen set.
2. Unfamiliarity with equipment.
3. Lack of experience with packet.
4. Lack of dedicated portable digipeaters.
5. Lack of practice.

Debrief

A short debrief was held. The following points were noted:

1. If using equipment other than one's own, or if supplying your equipment, an instruction sheet should be included to describe the basic operation and fault-finding of the equipment.
2. The packet format should be adopted as standard.
3. Practice beforehand is vital. (A re-discovery of the wheel!)
4. Redundancy is desirable.
5. More practice is needed using packet.
6. Standardisation of equipment would be nice but, under most circumstances, will never be achieved.
7. Reliability of equipment will always be a problem except through constant practice.

Conclusion

Many of the problems encountered may have been encountered by others long ago. This was the first attempt in the NT to establish and maintain communications by VHF packet and get away from the comfort and established situations of the home shack.

The use of packet where applicable would increase the throughput of a circuit with the added advantages of accuracy over voice. The participants in the exercise showed great enthusiasm and initiative when working under trying conditions.

The NTES intends conducting another exercise this year. Hopefully the scenario will test us to greater limits.

Trevor Connell VK8CO, Deputy Director, South Australia/Northern Territory

News from WICEN (NSW)

Now that the busy July/August period is over, WICEN (NSW) personnel can look forward to an easier time. The next exercise is the Como-Jannali Fun Run organised by Kevin VK2CKD for this month, but at the time of writing the actual date is not known. There is the Worrigee Horse Trial on the 19th September, and the contact is Dave VK2BDJ. Also, don't forget that the last day for renewals is 30th September — after that you will be unfinancial!

October gets busier. The next Coordinators' Conference will be held at Lismore on the 2nd October, and "mine host" is Greg VK2DIL. All coordinators should have been notified of this by now and, as it is in the school holidays, early bookings for accommodations are advised. Also on that long weekend, the 2nd-4th October, is the "Hobbyfest 93" exhibition, and this year WICEN (NSW) will have a joint display with the NSW Division of the WIA. Alan VK2YYJ (who arranged an eye-catching display at the July "Rescue 93 Expo") is organising this event. Personnel who are not taking part in JOTA on the weekend of 16-17th October may be interested in the Jenolan Cave Rescue exercise (limited to Cave Rescue Squad members) or the Red Cross Mini Marathon, which is a joint VK2/VK3 exercise organised by Jamie VK3KPU. Finally, the last major event for October is the annual Hawkesbury Canoe Classic, a paddle by moonlight, and Kevin VK2CKD is again the event commander.

The most important event in November (indeed, the only one) is the Big NSW/Vic Bike Ride, starting on 27th November and ending on 12th December. This is a large-scale exercise, and Simon VK2CSC requires as many people as possible, even if they can only spare a day or so. Further information on this event can be obtained from your coordinator, and will also appear next month.

The address of WICEN (NSW) Inc. is PO Box 123, St Leonards 2065. WICEN (NSW) conducts nets at various times; the only one we know about is the Sydney VHF Net every Thursday night at 2130 local time on repeater 7150 in Chatswood.

David Horsfall VK2KFU Publicity Officer WICEN (NSW) Inc.

ar

SEANET To Come of Age in Bangladesh

*Thomas E. King VK2ATJ**

The 21st annual convention of the Southeast Asia Network (SEANET) will be held from November 19-21, 1993 in Dhaka Bangladesh.

This is the first time the populous South Asian nation has hosted the prestigious amateur radio conference, a popular forum for amateurs from throughout Australasia.

SEANET '93 organisers, the Bangladesh Amateur Radio League (BARL) anticipates that more than 100 radio amateurs from a dozen countries, including Australia, will register to attend the three day event. As well, some 30 Bangladeshi amateurs, SWLs, enthusiasts and officials are expected.

One of the highlights of the conference will be a special exhibition of electronic, amateur and professional communications equipment — of local and foreign origin — set up in the official conference hotel, the Pan Pacific Sonargaon.

A special event amateur station operating on HF and VHF bands may also be authorised in Dhaka's leading hotel.

Amateur radio activities in the former East Pakistan were suspended at the outset of the Indo-Pakistan War in 1965. The BARL was set up in mid 1979 to promote the numerous benefits of amateur radio and lobby government agencies to permit the wireless hobby activity in the independent nation of Bangladesh. Amateur radio was legalised on August 28, 1991.

A number of SEANET '93 events have already been organised including a gala welcome dinner at the Hotel Sonargaon on Friday, November 15 and a buffet lunch/river cruise and an official dinner/cultural show set for the following day.

A plenary session featuring a series of presentations on issues facing IARU Region III amateurs will be the focus of activities on Sunday, November 21.

The registration fee for foreign participants is $US100 (about $A146). This includes all meals and activities in the conference program plus special souvenirs.

BARL has negotiated with the Hotel Sonargaon to obtain a special daily room and breakfast rate of $US115 (about $A168).

In addition, Biman Bangladesh Airlines, the official SEANET '93 air carrier, has agreed to provide a 25 per cent discount to convention delegates. As the airline does not yet serve Australia, delegates from Australia will need to connect with onward Dhaka-bound Biman flights in Singapore.

Further details are available from BARL, GPO Box 3512 Dhaka 1000, Bangladesh, tel (8802) 811 097/98 Attn: Saif Shahid, President BARL or FAX (8802) 891177 Attn: BARL.

Amateurs can also check into SEANET which meets daily at 1200 z on 14.320 MHz not only to learn about the activities of the net and the upcoming conference but to follow the progress of amateur radio developments in this little known Asian nation.

**PO Box 140 Kensington NSW 2033*

ar

Over to You — Member's Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Reading the Mail

In the July "Over to You" a letter from Bob Slutzkin VK3SK reminds me of my own experience in "reading the mail".

I was with PMG (preceding Australia Post and Telecom) for 45 years before retiring in 1981 and, of course, could read sounder morse.

I was a WT Op RAAF during WW II and was in a rehab hospital in Jervis Bay NSW after the war when I went into the local Post Office for some stamps. When asked by the counter officer for my requirements I said "Yes, I will have the telegram that just came through for me".

I had heard the sounder going at the back of the office and read the telegram before I had even received it. Even with a break of six years I could still read sounder Morse at about 25 wpm.

(PS. I expect to be in the Remembrance Day Contest again this year — CW of course!)

Ed Dyring VK2ED
PO Box 3
Gosford NSW 2250

Congratulations

I am writing to tell you how much I enjoy reading "Amateur Radio" each month, and to congratulate you on the general excellence of the magazine.

In "Amateur Radio" we still have really good "home brew" articles covering a wide section of the radio field. These articles seem to have virtually disappeared from most technical magazines — at least as far as amateur radio is concerned.

My thanks to you, your staff and the contributors.

Harvey Utber VK3AHU
PO Box 40
Violet Town VIC 3669

Thanks for Assistance

Stephen Pall VK2PS
Special Projects Officer
WIA NSW Division
Dear Stephen,

I would like to thank the Wireless Institute of Australia for the wonderful assistance provided in relation to the successful Australian Geographic Transcontinental Balloon Attempt.

The amateur radio display was most impressive and the team of volunteers who were on standby waiting for the departure of the flight, then on round-the-clock duty whilst the balloon was in flight, was greatly appreciated.

Could you please pass on to the large team of volunteers my appreciation for their incredible effort.

It was a wonderful support to both John and myself to know that we had several back-up communication systems in place should anything fail.

Stephen, I thank you for the large part you played as Operational Manager and Scheduler of Operators.

Thanks again, you were a great team.

Dick Smith VK2DIK
Australian Geographic

JA Visitor to VK

Last August ('92) a letter was published from JH5OWN who was planning a working holiday in VK. He stated how he would like to visit other amateur radio stations in VK-land. As a follow up, I have received a letter which I would like to share with other VK operators, and I quote:

How are you, Mr Penfoid? My name is Yoshiaki Goto (JH5OWN). I have been visiting this country since 1st August 1992 and was operating from VK as VK9NY, VK9NY/1, 2, 3, 4, 5, 6, 7 and 8. Every time I announced "QSL via my home call JH5OWN". But I think some QSL cards go to VK QSL Bureau. I am not a WIA member. Would you send QSLs for me if you get QSLs.

I was travelling this country and met lots of VK Radio Operators. I love Australia. Because this country has beautiful nature, and Australian Radio Amateur has good skill and very friendly.

I really enjoyed staying in VK with radio. Hi Hi. I appreciate all of VK operators'kindness.

Best Wishes 73
Yoshiaki Goto

I thank Yoshi for his letter and the SASEs that he enclosed for his QSL cards.

Neil Penfoid
VK9/0 QSL Bureau Manager
2 Moss Court Kingsley 6026

New HF CB Band?

Take a look on 7 MHz any night of the week. At 5 kHz spacing, starting at 7.000 MHz and running right up over 7.100 MHz, you will hear the new HF CB band in full swing. The accepted calling method for these non-amateur invaders is a cheerful whistle. It is mostly USB SSB. The language spoken is thought to be Indonesian. So, we have an "organised' intrusion on a grand scale into one of our most precious night-time DX bands. The interesting thing is that if you take and use a frequency (say 7.006 MHz CW), the commotion dies down on that channel. I presume the poor things have to move to 7.000, or 7.010 or 7.075.... to get away from the irritating dits and dahs.

Are we going to let these intruders take our band? Shall we simply move over and accommodate them? Or are we going to put up a fight? I have been operating at the low end of 7 MHz almost nightly, and I'm ashamed to say just a handful of regulars and myself generally have that part of the band all to ourselves (apart from the jolly band of CBers). The apathy on the part of Australian operators is appalling. Too comfortable sitting in front of the TV perhaps? If that is so, then maybe we deserve to lose this band. Others may follow — 10.1 MHz already has similar problems. Will the hallowed 14 MHz band be next? Use it or lose it!

Drew Diamond VK3XU
"Nar Mein" Gatters Road
Wonga Park VIC 3115

Spectrum Value

Referring to the July editorial. Many businesses are not happy to have radio spectrum management handed over to market forces and commercial interests. Some see it as an act of faith; acts of faith are not components of modern business management.

Non commercial spectrum reserves, like all nature reserves, are not only for recreation, or hobby use or for dilettante amusement. The real purpose is for community welfare, to provide reserves dedicated to the special needs of research, education and recreation, also to serve as representative samples of the environment against which changes can be compared, measured, and used as guides to future use. Those long established principles are admitted by all member governments of the ITU, they are not unique to New Zealand, and not a recent innovation for which an impertinent politician can claim credit.

The editorial in the July RSGB journal has more accurate information about the attitude of governments to the Amateur Service and the responsibilities of Radio Amateurs. It is not sufficient just to occupy the amateur bands, use must be a benefit to industry and the community at large; when it is not, those bands will be sold to the highest bidder.

Lindsay Lawless VK3ANJ
Box 760
Lakes Entrance Vic 3909

ar

VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC

Countries first worked from Australia on 50 MHz

This is the present state of the list, comprising 172 countries.

1 = Are there any earlier claims for these countries?

2 = Has anyone worked Thailand (HS1WR) other than VK9XT on 15/03/80?

3 = Did anyone work Okinawa as KR6 other than VK9XK, before 14/05/72?

Most operators have forwarded me their list of modes and times and I expect that the remainder will do so before the next and final list, which I hope can appear early next year and will include times. Where a mode is missing in the list, in most cases the time also is requested. I am not rushing the final list as I want to present it in its most accurate form. When I am happy with the list it will be released for general publication.

Station	Date	Country	Claimed by	Mode
3D2SM	20/05/90	Conway Reef	VK4FXX (VK4FP)	SSB
3D2JT	03/04/82	Fiji	VK4RO	SSB
3D2AG	23/03/92	Rotuma Is	VK2QF	SSB
4S7AVR	29/03/89	Sri-Lanka	VK6KXW	SSB
4X1IF	25/10/91	Israel	VK8AH	CW
5B4AZ	25/10/89	Cyprus	VK8AH 1	CW
5H1HK	04/04/89	Tanzania	VK8AH	CW
5W1AU	05/04/82	West Samoa	VK4ZNC	SSB
5Z4CS	28/03/82	Kenya	VK8GB	SSB
6W1QC	12/11/90	Senegal	VK4BRG	SSB
6Y5FS	24/03/90	Jamaica	VK2BA	SSB
7Q7JA	27/03/91	Malawi	VK6RO	CW
8P6JW	18/04/89	Barbados	VK2QF	SSB
8R1AH	02/04/89	Guyana	VK8RH	
9H1BT	25/03/89	Malta	VK8RH	
9K2ZR	03/04/92	Kuwait	VK6JQ	CW
9L1US	08/10/90	Sierra Leone	VK4BRG	SSB
9M2DQ	26/09/59	Malaysia West	VK6BE	
9M8STA	13/08/89	Malaysia East	VK8ZLX	SSB
9N1BMK	02/05/79	Nepal	VK8GB	SSB
9Q5EE	06/04/91	Zaire	VK3OT	CW
9V1ES	17/11/89	Singapore	VK8ZLX	SSB
9Y4LL	10/04/82	Trinadad	VK8GB	SSB
A22BW	26/04/91	Botswana	VK6JJ	CW
A35JT	10/04/82	Tonga	VK4ZNC	SSB
A45ZM	04/04/90	U.A.E.	VK8RH 1	
AH8A	19/04/81	Am. Samoa	VK2VC (KH8)	SSB
BV2DQ	30/08/91	Taiwan	VK6JQ	CW
BY5RA	28/09/84	China	VK8GB	CW
C21AA	20/12/70	Nauru	VK4ZRW (VK4IT)	SSB
C6ANY	21/04/92	Bahamas Is	VK2QF	CW
CE0DFL	24/04/90	Easter Is	VK4ZJB	SSB
CE3/KB6SL	14/10/90	Chile	VK4BRG	SSB
CN8ST	20/10/91	Morocco	VK8RH	
CO2KK	16/04/89	Cuba	VK2BA	CW
CR9AJ	24/09/78	Macau	VK8GB	SSB
CT1LN	03/03/90	Portugal	VK4RO	SSB
CU3/N6AMG	27/11/91	Azores	VK2QF	CW
CX4HS	16/04/92	Uruguay	VK4FP	SSB
DL8HCZ	12/10/89	Germany	VK8GF	SSB
DU6/WB5LBJ	11/10/77	Philippines	VK8GB	SSB
EA8/G3JVL	02/11/89	Canary Is	VK8AH	SSB
EI6AS	12/10/89	Ireland	VK8ZLX	SSB
EK0JA	20/04/92	Asiatic Russia	VK8ZLX (UA0)	SSB
ES5PC	29/01/92	Estonia	VK6PA	SSB
F9DI	14/10/89	France	VK8ZLX	SSB
FK8AX	15/12/78	New Caledonia	VK3AKK 1	SSB
FM5WD	11/04/90	Fr. Martinique	VK8ZLX	SSB
FO0CI	13/03/92	Clipperton I	VK4DDC	SSB
FO8DR	12/04/81	Fr. Polynesia	VK2BA	CW
FW/W6JKV	23/03/90	Wallis & Fortuna	VK4ZJB	SSB
FY5AU	30/03/89	French Guyana	VK4BRG	CW
G4FJK	20/03/89	England	VK6KXW	SSB
GD3AHV	28/02/90	Isle of Man	VK6HK	CW
GI4OPH	12/10/89	North Ireland	VK8ZLX	SSB
GJ4ICD	12/10/89	Jersey Is	VK4DDG	SSB
GM4GDT	28/02/90	Scotland	VK6HK	CW
GU2HML	01/11/89	Guernsey	VK4JH	
GW3LDH	12/10/89	Wales	VK8ZLX	SSB
H44DX	26/04/79	Solomon Is.	VK8GB	SSB
HB0AHB	13/10/91	Liechtenstein	VK6PA	CW
HB9SJV	03/01/92	Switzerland	VK6PA	SSB
HC5K	26/03/89	Ecuador	VK2MQ	SSB
HH7PV	19/09/89	Haiti	VK2BA	SSB
HI8WPC	02/04/89	Dominican Rep	VK2BA	SSB
HK0/W6JKV	01/04/92	San Andreas Is	VK2QF	CW
HK1JXV	19/03/90	Colombia	VK4ZNC	SSB
HL9WI	04/09/69	Korea	VK4ZAZ	AM
HP3XUH	25/01/89	Panama	VK4ZNC	SSB
HR1WPK	02/04/90	Honduras	VK5RO	CW
HS1WR		Thailand	2	
I4ICL	15/02/91	Italy	VK4FP	SSB
IS0AGY	10/11/91	Sardinia	VK4FP	SSB
J73PD	03/04/89	Dominica	VK4KJL	
JA1AHS	22/01/56	Japan	VK4NG (SK)	AM
JD1ADP	05/05/79	Ogasawara Is	VK8GB	SSB
JD1YAA	31/03/84	Minami Torishima	VK8GB	SSB
JT1CO	28/09/91	Mongolia	VK6HK	SSB
KC6IN	23/03/80	East Caroline Is	VK8GB (V63)	SSB
KC6SZ	14/10/79	Yap — W.Car.Is	VK4JH	
KG4SM	25/03/89	Guantanamo Bay	VK2QF	SSB
KG6/K7HIX	22/03/69	Guam	VK4ZAZ (KH2)	SSB
KG6RO	24/09/78	Saipan	VK8GB (KH0)	SSB
KH0AC	07/04/89	Mariana Is	VK4ZAZ	SSB
KH1/VK9NL	03/04/88	Howland Is	VK4TL	CW
KH3AB	28/03/81	Johnston Is	VK8GB	SSB
KH4AE	28/02/91	Midway Is	VK4BRG	SSB
KH5/W6HTH	17/04/81	Jarvis/Palmyra	VK5RO	SSB
KH6/W7ACS	26/08/47	Hawaii	VK5KL	AM
KH7/KH6JEB	23/03/90	Kure Is	VK4KK 1	SSB
KL7/WA4TNV	13/03/79	Alaska	VK2KAY	SSB
KP2A	26/03/89	Am. Virgin Is	VK3OT	SSB
KP4AAN	13/04/81	Puerto Rico	VK2DDG	SSB
KR6BU		Okinawa	3	
KX6AF	20/03/58	Marshall Is	VK4NG (SK)	AM
KZ5NW	04/03/79	Canal Zone	VK4RO	CW
LA3EQ	25/02/89	Norway	VK6WD	SSB
LU8OB	28/04/58	Argentina	VK4NG (SK)	AM
LX1SI	27/10/90	Luxembourg	VK6JQ	CW
OA8ABT	23/10/89	Peru	VK8AH	SSB
OE5PAM	01/03/91	Austria	VK6JQ	CW
OH1YP	25/02/89	Finland	VK6KXW	SSB
OK1DIG	08/02/91	Czechoslavakia	VK6PA	
ON7YD	28/10/90	Belgium	VK6JQ	CW
OZ1LO	20/10/90	Denmark	VK4JH	
P29GR	23/11/75	Papua N.Guinea	VK4ZJB	SSB

Station	Date	Country	Claimed by	Mode
P43AS	26/03/89	Aruba Is	VK4KJL	
PA0RDY	12/10/89	Netherlands	VK4ZJB	SSB
PJ9JT	02/03/89	Curacao/Bonaire	VK4PU	SSB
PY0FF	26/03/92	Fernando/Norona	VK6PA	SSB
PY5CC	20/04/91	Brazil	VK7IK	
PZ1AP	30/03/89	Suriname	VK4BRG	SSB
S21ZE	11/10/92	Bangladesh	VK8RH	
SM6PU	25/02/89	Sweden	VK6KXW	SSB
SV1DH	17/10/89	Greece	VK8AH	SSB
T20AR	15/12/87	Tuvalu	VK2XJ	SSB
T32AB	15/03/82	Kiribati East	VK2DDG (VK4DDG)	SSB
T33JS	19/05/89	Banaba Is	VK4BRG	SSB
T3AZ	17/03/80	Kiribati West	VK4RO	SSB
T70A	20/10/91	San Marino	VK6JQ	CW
TG9AWS	28/03/89	Guatemala	VK2BA	SSB
TI2NA	26/03/81	Costa Rica	VK2DDG (VK4DDG)	SSB
TL8MB	03/04/91	Central Africa	VK6JQ	CW
V31PC	19/04/89	Belize	VK4ZAZ	SSB
V51E	25/04/91	Namibia	VK6KXW	SSB
VE7AQQ	06/04/59	Canada	VK2ADE (VK4QM)	AM
VK0WW	10/12/72	Macquarie Is	VK2NN	SSB
VK2BKE	05/01/75	Lord Howe Is	VK3ZNJ (VK3AKK)	SSB
VK2BZ	05/12/48	Australia	VK7LZ	AM
VK9NT	01/06/58	T.New Guinea	VK4ZAZ	SSB
VK9XK	29/11/51	Papua	VK4BJ	
VK9XT	10/03/80	Christmas Is	VK8GB	SSB
VK9ZM	13/01/89	Mellish Reef	VK2BA 1	SSB
VK9ZM	22/11/78	Willis Is	VK2BNN (SK)	SSB
VK9ZNG	27/11/75	Norfolk Is	VK2ZRU	SSB
VK9ZYX	22/11/81	Cocos Keeling Is	VK8GB	SSB
VP1MT	13/04/79	Br. Honduras	VK5RO	SSB
VP2MO	01/04/89	Montserrat	VK2BA	SSB
VP2VGR	17/03/81	Br. Virgin Is	VK3OT	CW
VP5D	25/03/89	Turks/Caicos	VK2QF	SSB
VR2BC	18/12/49	Fiji	VK2AH	SSB
VR6JJ	13/03/93	Pitcairn Is	VK4BRG	CW
VS2DQ	19/04/58	Malaya	VK6ZAV	AM
VS5DX	26/11/80	Brunei	VK8GB	SSB
VS6HK	05/05/78	Hong Kong	VK4RO	SSB
VU2JPN	17/03/81	India	VK8GB	SSB
W6PUZ	14/03/58	USA	VK4HD (SK)	AM
XE1FU	01/05/59	Mexico	VK3ALZ	AM
XF4L	14/04/89	Revilla Gigedo	VK2QF	SSB
XU0UN	23/02/93	Cambodia	VK8AH	SSB
YB0X	01/05/79	Indonesia	VK4RO	SSB
YJ8KM	01/11/76	New Hebrides	VK4ZSH	SSB
YO7VY	21/10/91	Romania	VK8RH	
YS1ECB	06/04/84	El Salvador	VK2DDG (VK4DDG)	SSB
YU3EA	03/03/91	Yugoslavia	VK6JQ	CW
YV5/DL3ZM	18/03/81	Venezuela	VK4RO	CW
ZA1ZJ	27/10/91	Albania	VK6JQ	CW
ZB0T	22/10/91	Gibraltar	VK8RH	
ZC4MK	31/10/90	Sov/Bases Cyprus	VK6RO	CW
ZD7BW	21/03/81	St. Helena Is	VK4TL	CW
ZD8TC	20/03/82	Ascension Is	VK4RO	CW
ZF2DN	28/03/81	Cayman Is	VK2BA	CW
ZK1WL	28/03/89	North Cook Is	VK2QF	CW
ZK1WZ	28/03/89	South Cook Is	VK4ZAZ	SSB
ZK2RS	29/12/82	Niue Is	VK2BA 1	SSB
ZK3KY	13/10/90	Tokelau	VK4BRG	SSB
ZL2MF	21/12/47	New Zealand	VK5GF (SK)	AM
ZL4OY/C	19/06/83	Chatham Is	VK2BA	SSB
ZL9TPY	21/01/90	Auckland Is	VK2VC	SSB
ZM8OY	10/12/85	Kermadec Is	VK4PU	SSB
ZP6XDW	28/04/91	Paraguay	VK4BRG	CW
ZS6LN	18/05/81	South Africa	VK6WD	CW
ZS9H	25/04/91	Walvis Bay	VK6KXW	SSB

One never knows where Amateur Radio magazine may be found and the interest created by the presentation of the above First Worked list.

A few days ago I received a letter from Alan Woodacre VE2AEJ/VE3HX in which he refers me to an item in the QUA column of *The Canadian Amateur Radio Magazine* outlining the contact between VK2ADE and VE7AQQ as possibly being the first VK-VE contact and suggesting that if earlier contacts were known, details should be forwarded to me.

Alan writes *I was active on 6 metres as VE7AIZ in the mid to late 1950s and remember hearing an awful lot of stations working Ike VE7AQQ. He obviously put out a fine signal. Normally I could not hear Ike although I did work him once on aurora. I remember reading in the VHF column from an old QST or CQ in the late 1940s, about a report of a possible 6 metre QSO between VE7AEZ and a VK station. I remember the VE call as it was close to mine at the time.* So time will tell if there are any developments from the message in the magazine.

The local scene

There is little to report of any consequence. On six metres there are constant reports of contacts to JA from VK4 and VK8 stations. On 12/4 VK6AO, VK6HK, VK6WD and VK6YU had contact with Ross XU0UN. The grapevine told me VK6RO was also involved but this is unconfirmed.

The high pressure systems situated near the Great Australian Bight are placed too high into the continent to give assistance for the extension of 144 MHz propagation, let alone any higher bands. In Adelaide there is continuing local activity on 2304 MHz and 10 GHz.

From Japan

Now, although a little late, the May issue of CQ ham radio from Japan, courtesy Graham VK6RO, lists the spread of contacts made by Japanese stations from 1/3 to 28/3: 5R8DP, 7Q7CM 7Q7JL, 7Q7RM, AH6LR, BV2DP, FK8DH, FK8GA, HL9UH, JA, KG6DX, KH6HH, KH6HI, LU8MBL, NI6E/KH6, P29CW, P29JA, P29ZGD, PP5WL, PY2CDS, PY2DSC, PY2XW, T20AA, T30JH, V73SG, V85PB, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VR6JJ, XU5DX, XU5DX, YC0UV0, ZL1TXB, ZP5HSB, ZP5JCY, ZP5PT, and ZP5ZR, a total of 21 countries! In addition, the following beacons were heard: 9M-TV, DX1HB/b, FR5SIX/b, KH6HI/b, KH6HME/b, P29BPL/b, PY2AA/b, PY2AA/b, PY2AMI/b, VK-TV, VK4BRG/b, VK8VF/b, VR6JJ/b, VS6SIX/b and ZL-TV. The above are not necessarily one off contacts, many are repeated time and again.

Included in the above are some good F2 contacts to 5R8, 7Q7, KH6, LU8, PY2, VR6 and ZP5. We certainly live on the wrong side of the equator! It will be interesting to see what is provided by the April listings.

News from Europe

Ted G4UPS advises that what appeared to be the first Es opening across the Atlantic occurred on 31/5 when HK1BDN worked into EA after 2200. On 3/6 VE1ZZ was heard calling CQ but no contacts. On 5/6 CT4KQ worked W1/VE1 from 1945. Ted worked VE1XDX on CW at 2142.

Leo EH8ACW from the Canary Islands is the only EA8 station with a six metre permit and worked into the UK on 1/6.

The Bosnia-Herzogovina prefix has changed from 4N4 to T95. The six metre band has been released for general use

in Greece but SV7 and SV8 stations count as SV. The first mention of activity from the island of Crete was from SV9ANJ but no reports of contacts into G.

Both **Ted G4UPS** and **Geoff GJ4ICD** report fantastic Es conditions for June with strong contacts to all parts of Europe and across the Atlantic to the USA and Canada. They also mention the two metre Es contacts to various countries. I am interested in a comment by Geoff made on 14/6 when he states *I am sure you can spot that once again there is a monthly repeat of the big "Es" opening, 12 May and then this almighty opening, for three days non stop, even through the night again.... these conditions are really unbelievable, and I'll stick my neck out again and say that I believe that these conditions are Solar related, maybe dying sunspots or something, but the evidence is there (activity from the sun early May/June) even in the southern hemisphere these conditions exist in their summer, why?*

My comment is that such massive openings are not unusual during the early summer and, as he says, it occurs in the southern hemisphere too. What the UK and European operators are experiencing is just how widespread Es contacts can be and with immensely strong signals. Having been starved of six metre contacts for years, with the release of the band in so many countries within Es range, they are now confronted with some of the truths about the band that we have known for years; things like 1600+ km contacts at S9 from a station running 1 watt, stations with 1/4 wave whip antennas, indoor antennas, backscatter and short skip contacts, signals coming from all directions and so it goes on. Bear in mind that Australia wide contacts (VK4 to VK6) of around 4000 km are not uncommon, probably similar to working UK to eastern USA and Canada. Somewhat more difficult for us are those from VK6 to ZL at distances of around 6000 km, but they do occur. That's the fascination of six metres.

I have repeatedly said that, as the solar count for a particular cycle declines, then the degree of Es rises, peaking at the lowest point between cycles, hence the greatly increased occurrence of Es on two metres. I don't have to stick my neck out on that one because it has not been refuted and there is ample evidence to support the statement! New areas/stations to be granted permits or open recently are Jan Mayen Island JX3EX, Crete SV9, Dodecanese SV5, 4N4 is now T95, Ukraine UB5BW, Western Sahara SO1AB, Andorra C31HK, Ethiopia ET3DX, Madagascar 5R8DP, Madeira CT3FT, Belarus UC2AA, Romania YO4BZC, San Marino T70A, Iraq YI1 (permit but no gear!), St Pierre and Miquelon FP/VE1KM. Dxpeditions to Tunisia 3V, August 1993, St Peter and St Paul Rocks, PY0S, Jan/Feb 1994.

I note that Geoff GJ4ICD has now worked 145 countries but would like to add JX, SV9, HA, 3V and Z31 to clean up what is available within the European sector. Maybe he will achieve those countries before he tires of the continual Es openings. Life for some amateurs must be a chore at times! How different from the hours/days VK stations listen to nothing but noise or a muted receiver while it scans six metres! Geoff has also notched up 599 grid squares. Oh well.

USA is busy

Emil Pocock W3EP writing QSTs *The World Above 50 MHz* said their Es season started early this year, 29 April in fact, with many openings throughout May.

A massive tropo opening occurred 2-4 June across the southeast USA with 1900 km contacts on 144 and 432 MHz. KM4ID in square EM93 used both bands for 1975 km contacts to N5FA in DM91. Condy NI4Z from EL38 in Orlando worked on bands up to 1296 MHz to WB5ULA and others in EM13, a distance of more than 1600 km. Two metres Es opened in the US on more than half a dozen days during June and many excellent contacts were made over distances to 2000 km.

Emil draws attention to the similar two metre Es conditions which existed in Europe during June, but particularly on 10/6 when G3FPK reported that Charlie EI2FK worked 280 stations in 63 grids between 1640 and 2015 — that is more than a station per minute for more than three hours! His log listed I 62 stations, DL 125, HB 26, HA 6, F 5, ON 1, OE 10, OK 26, OM 6, SP 32, and 9A 3. His best DX was 2250 km — typical of E-skip openings on both continents.

Es increased during June with Larry N0LL in EM09 reporting openings on all but five days, with around ten trans-Atlantic openings from the north-eastern stations and Canadian maritime provinces. CU1EZ in the Azores worked deep into the USA including a string of Texan stations, while CT4KQ in Portugal worked W1s and VE1s. Ted Collins G4UPS worked VE1XDX while VE1ZZ worked many EHs in Spain. These are all really long distance contacts.

The best openings to Europe were on 11-12/6 and lasted eight hours from 1835 to 0233. **Emil W3EP** writes *Bob and Lefty Clement, K1TOL were wakened by their propagation alarm just after 5 am local and were rewarded by working 9H, I, DL and S5 from 0925 to 1135. Bob's total for ten hours shows 108 stations in 18 countries, including EH, EH6, EH8, F, G, GJ, GM, LX, OE, OK, ON, OX and OZ.*

The VHF Contest which began at 1800 on 12/6 produced a flood of stations in the US, so many that they were obviously calling over the top of the European stations trying to get through in the DX window of 50.100 to 50.125 MHz. (Now I wonder where I would have heard that comment before!!...5LP). Emil says that the European calling frequency is 50.200 and Europeans are used to filling the band to 50.300 and beyond when things get lively and sees no reason why US stations should not likewise spread out.

I am sure that all the above augurs well for the southern hemisphere summer period. For the next several years I am sure there will be increased Es activity on six metres, leading to a significant increase in two metre Es. Remember the massive Australia wide openings during December 1985 and 1986, right at the minima between Cycles 21 and 22? See Amateur Radio for March 1986 and 1987 for the maps I produced indicating the wide distribution of Es on two metres.

Many of you will be adding summer contacts to your log using Es on six metres, but remember to monitor 144.100 whenever you are on the band. If two metres opens, leave six metres and work what you can on two metres using brief contacts as the band generally does not stay open for hours as can six metres, sometimes the openings maybe as short as two minutes! One of the better indicators for two metres is strong short skip on six metres, eg VK3 opens to VK5. But don't hog the calling frequency of 144.100, spread out a bit, the other stations will find you because you won't be under someone else!

VK news is scarce this month, hence the inclusion of the list of first worked stations. Correspondence from a number of "old timers" regarding the list has been interesting in that there are snippets of information relating to their very early days on six metres. As space permits I would like to include this information for your reading and to ensure that it is recorded for posterity.

Closure

Closing with two thoughts for the month:

1. So far nobody has invented an intelligence test to equal matrimony, and
2. The water problem is interesting. Will we run out of the stuff before we have a chance to pollute it completely?

73 from The Voice by the Lake

PO Box 169 Meningie SA 5264

ar

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$20.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 1 — ARRL	BX163	$22.00
Antenna Compendium Vol 2 — ARRL	BX292	$24.00
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1988	BX259	$104.00
Cubical Quad Antennas — Haviland — 1993	BX041	$37.50
Easy Up Antennas	MFJ38	$39.25
HF Antennas for All Locations — Moxon	BX188	$45.00
G-QRP Antenna Handbook	BX452	$22.50
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX182	$18.00
Physical Design of Yagi — 3.5" IBM Disk	BX388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX388A	$20.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX028	$49.00
Practical Wire Antennas — RSGB	BX296	$28.00
Reflections — Software 5 inch disk	BX358	$20.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$20.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$40.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$8.60
Smith Charts S/Scale 1 SET co-ord Imp/Admit Pack of 10	BX901	$6.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$8.60
The Antenna Handbook — ARRL 1991 edition	BX370	$40.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BATC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$49.95
Radio Call Book North America 1993	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley QTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX266	$58.00
Radio Theory For Amateur Operators — Swainston — 1991	BX367	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$55.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX196	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1976	BX263	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1989	BX181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BX186	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Ferrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$12.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$18.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1986	BX262	$79.90
Radio Auroras — RSGB	BX381	$30.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$35.00
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$16.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$36.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing — ARRL	BX386	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX396	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band DXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$36.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$20.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX268	$18.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$16.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$24.00
Packet Computer Networking Conference 1-4 1982/5	BX166	$36.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BX187	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX188	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Operator's Manual — Rogers — 1993	BX043	$37.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$32.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$24.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$40.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX328	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$17.30
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX446	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX385	$40.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German only	BX354	$62.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$40.00
UHF/Microwave Experimenters Software — ARRL	BX327	$20.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX268	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX436	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$25.00
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$48.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Car Bumper Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1993		$11.00
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

HF Predictions

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 52.3. The predicted sunspot numbers for October and November are 49.8 and 45.3 respectively.

ar

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.5	8	8.4	6	-4	-18	-38	...
2	10.0	-1	7.7	2	-8	-21	...	...
3	10.4	-5	8.0	1	-6	-17	-35	...
4	14.1	1	10.7	1	1	-4	-15	-29
5	19.6	5	15.1	-1	5	4	0	-8
6	21.5	5	15.8	-2	5	5	1	-6
7	21.3	5	16.0	-2	5	5	1	-8
8	19.8	5	15.8	0	5	4	-1	-10
9	18.0	6	14.2	3	6	2	-5	-15
10	15.9	7	12.6	6	5	0	-11	-25
11	14.0	8	11.1	8	3	-5	-20	-36
12	12.5	9	9.9	8	0	-12	-30	...
13	11.5	13	9.1	9	-3	-18	...	...
14	10.9	19	8.6	10	-7	-25	...	...
15	10.5	25	8.3	11	-10	-30	...	...
16	10.3	28	8.0	11	-11	-33	...	...
17	10.1	29	7.5	10	-13	-36	...	...
18	9.5	31	7.0	7	-19	...	...	...
19	9.0	31	6.7	4	-24	...	...	...
20	9.7	30	6.6	8	-17	...	...	...
21	9.5	30	6.6	6	-20	...	...	...
22	9.0	24	6.3	2	-23	...	...	...
23	8.7	15	6.2	0	-23	...	...	...
24	9.5	10	6.9	2	-15	-34	...	...

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.1	4	8.1	5	0	-9	-23	...
2	11.7	6	7.9	7	-1	-11	-28	...
3	11.1	9	7.6	8	-3	-15	-34	...
4	10.6	14	7.4	8	-5	-20	...	...
5	10.3	17	7.3	9	-7	-24	...	...
6	11.2	24	8.1	15	-2	-19	...	...
7	13.8	23	10.0	22	9	-3	-20	...
8	15.4	22	11.9	24	16	7	-6	-21
9	12.4	15	9.5	14	5	-5	-22	...
10	11.9	7	9.1	8	2	-7	-21	-39
11	12.1	0	9.6	3	0	-8	-22	-38
12	11.4	-8	9.0	0	-2	-9	-21	-37
13	11.0	-14	8.7	-2	-2	-8	-20	-34
14	10.8	-18	8.4	-3	-2	-8	-18	-32
15	10.6	-24	8.2	-6	-4	-9	-20	-34
16	9.9	...	7.6	-15	-13	-19	-31	...
17	9.4	...	7.1	-21	-20	-27	...	...
18	10.2	-37	7.7	-13	-10	-16	-27	...
19	12.7	-13	10.0	-7	-2	-5	-12	-23
20	16.5	-2	12.6	-9	0	-1	-5	-13
21	16.8	0	11.4	-6	1	0	-4	-12
22	15.0	0	10.1	-1	2	-1	-9	-19
23	13.8	1	9.3	1	2	-3	-13	-26
24	12.9	2	8.7	4	1	-6	-18	-33

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.9	0	9.1	3	-1	-10	-26	...
2	12.4	-4	9.4	0	-1	-8	-20	-36
3	16.5	1	12.4	-4	2	0	-6	-15
4	22.0	5	16.9	-10	2	5	3	-1
5	25.8	6	20.1	-14	2	6	7	4
6	25.9	6	21.2	-14	1	6	6	3
7	25.1	6	20.4	-13	2	6	6	3
8	23.6	6	19.0	-9	4	6	5	1
9	21.9	7	18.5	-2	6	7	4	-2
10	20.1	9	16.0	5	10	8	2	-6
11	18.4	11	14.6	10	11	7	-1	-12
12	16.9	14	13.4	15	12	5	-5	-19
13	15.9	18	12.6	21	13	4	-10	-26
14	14.9	22	11.8	24	13	1	-16	-35
15	14.0	25	11.1	24	10	-3	-23	...
16	13.4	27	10.5	24	8	-7	-29	...
17	12.9	28	10.0	23	5	-11	-34	...
18	11.7	29	9.1	19	-1	-20	...	...
19	10.4	30	8.0	12	-11	-34	...	...
20	11.0	30	8.4	15	-6	-27	...	...
21	14.5	27	11.4	27	13	-1	-20	...
22	14.4	24	11.1	24	13	0	-16	-35
23	12.8	17	9.9	15	5	-7	-25	...
24	13.9	11	10.7	11	6	-3	-17	-34

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.6	12	22.0	13	19	18	15	9
2	27.1	12	20.7	12	18	18	15	10
3	27.1	12	21.4	11	18	18	15	10
4	27.3	12	22.6	12	19	19	16	10
5	27.2	13	22.3	14	20	19	16	10
6	26.5	13	21.6	17	21	20	16	10
7	25.3	14	20.4	21	23	21	15	8
8	24.0	16	20.2	29	27	22	14	5
9	22.7	20	18.1	39	32	24	14	2
10	21.2	21	16.8	39	30	21	9	-4
11	19.9	22	15.8	38	27	17	4	-11
12	19.0	22	15.1	37	25	14	0	-16
13	17.8	23	14.1	35	22	10	-7	-25
14	16.3	24	13.0	31	16	2	-17	-38
15	15.1	24	11.9	28	11	-5	-27	...
16	14.2	25	11.1	25	6	-11	-35	...
17	12.7	26	9.9	18	-4	-25	...	...
18	10.8	27	8.3	7	-22	...	...	...
19	11.1	27	8.6	9	-18	...	...	...
20	11.9	27	9.1	15	-10	-33	...	...
21	17.2	21	13.2	29	18	6	-9	-27
22	24.6	16	19.1	26	25	22	15	7
23	26.4	14	21.2	20	23	21	16	10
24	26.4	13	21.5	16	20	19	15	9

VK EAST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.5	24	23.2	34	35	33	28	22
2	27.3	24	22.8	34	35	33	28	22
3	27.3	24	22.5	36	36	33	28	22
4	26.9	25	22.0	37	37	34	28	22
5	26.1	26	21.1	40	38	34	28	21
6	24.5	28	19.6	44	40	35	27	18
7	22.7	30	18.0	46	40	34	25	14
8	20.8	32	16.5	46	38	31	20	9
9	18.9	34	15.0	45	36	27	15	1
10	17.4	35	13.8	44	33	23	9	-5
11	16.3	36	12.9	42	31	19	4	-11
12	15.2	37	12.0	40	27	15	-1	-18
13	14.2	38	11.2	38	23	10	-7	-26
14	13.5	39	10.5	36	21	6	-12	-32
15	12.9	40	10.1	35	18	3	-16	-37
16	11.8	41	9.1	31	12	-3	-26	...
17	10.4	42	8.0	25	4	-15	...	...
18	11.0	42	8.4	28	8	-9	-34	...
19	14.6	36	11.0	37	24	11	-5	-22
20	19.9	29	15.3	39	33	26	16	4
21	24.0	26	18.8	38	35	31	24	16
22	26.0	25	20.8	36	36	32	27	20
23	26.7	24	21.7	35	35	32	27	21
24	27.1	24	22.4	34	35	32	28	21

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.7	8	21.7	-4	7	10	9	5
2	23.4	10	18.6	3	11	11	8	2
3	20.4	11	16.2	10	13	10	4	-4
4	18.2	14	14.4	16	14	9	0	-12
5	17.0	18	13.5	22	16	8	-4	-18
6	16.2	23	12.8	27	17	7	-8	-24
7	15.3	25	12.2	28	16	4	-12	-31
8	14.7	26	11.6	28	14	1	-16	-36
9	13.9	28	10.8	27	11	-3	-23	...
10	12.8	29	9.9	23	6	-10	-32	...
11	11.6	30	8.9	19	0	-19	...	...
12	12.3	29	9.4	22	4	-13	-37	...
13	14.4	27	11.4	27	12	-1	-21	...
14	12.6	25	9.7	20	4	-11	-32	...
15	12.1	18	9.4	14	1	-13	-33	...
16	11.7	9	9.1	8	-3	-16	-36	...
17	10.2	-1	7.9	1	-8	-22	...	...
18	10.7	-6	8.2	0	-6	-17	-34	...
19	14.3	-2	10.9	-2	0	-4	-14	-27
20	19.6	3	15.2	-7	2	3	-1	-8
21	23.6	5	18.5	-11	2	5	4	0
22	25.4	5	20.1	-13	1	6	6	2
23	25.9	6	21.1	-13	2	6	6	3
24	26.2	6	21.7	-10	4	7	7	4

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.5	13	8.1	8	-7	-23	...	...
2	11.0	9	8.4	7	-4	-18	-39	...
3	14.8	10	11.7	10	6	-1	-14	-30
4	20.4	10	15.3	10	12	9	2	-7
5	22.2	8	16.4	5	10	9	4	-3
6	22.9	7	16.8	3	9	9	5	-2
7	22.8	7	16.4	2	9	8	4	-2
8	22.0	7	15.7	3	9	8	3	-4
9	20.6	8	14.6	6	10	7	1	-8
10	18.8	9	13.2	9	10	6	-2	-13
11	16.6	10	11.6	11	8	1	-10	-23
12	14.5	11	10.1	11	5	-4	-19	-37
13	12.8	14	8.9	12	0	-12	-32	...
14	11.5	18	8.0	11	-5	-21	...	...
15	10.9	24	7.5	12	-9	-29	...	...
16	10.4	27	7.1	10	-13	-35	...	...
17	10.0	29	7.0	9	-16	...	...	...
18	9.7	30	6.8	7	-19	...	...	...
19	9.3	30	8.6	4	-23	...	...	...
20	9.3	30	6.7	4	-24	...	...	...
21	10.1	30	7.0	9	-15	-39	...	...
22	9.6	29	8.8	6	-20	...	...	...
23	9.3	23	6.7	4	-21	...	...	...
24	10.2	17	7.4	6	-12	-32	...	...

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.0	7	9.2	7	-1	-12	-29	...
2	12.4	0	9.4	3	0	-9	-23	...
3	16.7	3	13.2	0	4	1	-6	-16
4	22.6	6	17.4	-7	4	6	4	0
5	24.4	5	20.4	-11	2	6	5	1
6	24.3	5	20.1	-13	1	5	5	1
7	23.9	5	19.6	-13	1	5	4	0
8	23.1	5	18.7	-10	2	5	4	0
9	21.5	5	17.2	-5	4	5	2	-3
10	19.5	6	15.4	0	8	5	0	-8
11	17.2	7	13.6	6	7	3	-6	-17
12	15.2	10	12.0	10	6	-1	-14	-30
13	13.5	14	10.7	13	3	-8	-26	...
14	12.5	20	9.9	15	0	-15	-37	...
15	11.8	24	9.3	15	-3	-22	...	...
16	11.4	26	9.0	14	-6	-26	...	...
17	11.2	28	8.8	14	-7	-28	...	...
18	11.0	28	8.6	14	-9	-30	...	...
19	10.4	29	8.0	10	-15	-38	...	...
20	9.8	29	7.5	6	-20	...	...	...
21	10.6	29	8.1	12	-12	-35	...	...
22	13.0	27	10.0	22	5	-10	-33	...
23	12.5	22	9.7	17	3	-11	-32	...
24	14.4	17	11.1	17	9	-1	-16	-34

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.8	-11	7.5	-2	-6	-14	-28	...
2	10.2	-9	7.2	-1	-8	-18	-34	...
3	9.7	-6	6.9	-1	-10	-23	...	...
4	9.3	-3	6.7	-1	-13	-28	...	...
5	9.3	2	6.8	0	-15	-32	...	...
6	10.1	7	7.5	3	-11	-27	...	...
7	12.1	12	9.1	9	-2	-15	-34	...
8	14.6	14	11.0	15	6	-3	-18	-34
9	16.8	14	12.6	17	11	4	-8	-21
10	16.0	12	10.9	14	9	1	-11	-25
11	13.6	8	9.5	8	2	-6	-19	-35
12	12.0	0	8.4	1	-2	-11	-24	...
13	11.3	-7	7.6	-2	-5	-13	-28	...
14	10.7	-15	7.2	-4	-5	-12	-25	...
15	10.2	-24	7.0	-6	-7	-14	-26	...
18	10.0	...	6.8	-16	-15	-22	-35	...
17	9.7	...	6.7	-24	-22	-29	...	...
18	9.2	...	6.4	-31	-30	-37	...	...
19	8.9	...	6.3	-34	-33	...	...	...
20	9.8	...	7.0	-23	-22	-26	...	...
21	11.8	-19	7.9	-8	-5	-8	-17	-28
22	13.6	-12	9.5	-10	-4	-6	-13	-23
23	12.4	-13	8.7	-7	-4	-8	-17	-28
24	11.5	-13	8.0	-4	-5	-10	-22	-36

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.7	10	17.7	9	13	11	5	-3
2	21.9	9	18.2	7	12	10	5	-3
3	22.1	9	18.7	6	12	10	5	-3
4	21.9	9	18.3	7	12	10	5	-3
5	21.8	10	18.1	8	12	11	5	-3
6	21.5	11	17.6	11	14	11	4	-4
7	20.8	12	16.9	14	15	11	3	-6
8	19.3	14	15.5	19	16	10	-1	-13
9	17.6	20	14.0	29	18	7	-8	-25
10	15.8	21	12.5	27	12	-2	-21	...
11	14.1	22	11.2	22	3	-14	-38	...
12	12.7	24	10.1	16	-6	-28	...	...
13	11.9	24	9.4	12	-14	-38	...	...
14	11.2	25	8.9	7	-21	...	...	...
15	10.8	25	8.5	3	-27	...	...	...
16	10.5	25	8.3	2	-30	...	...	...
17	10.3	25	8.1	0	-32	...	...	...
18	9.6	26	7.4	-7	...	...	...	...
19	8.8	26	6.8	-16	...	...	...	...
20	9.5	26	7.2	-8	...	...	...	...
21	12.1	24	9.2	13	-11	-35	...	...
22	16.1	13	12.4	16	8	-2	-17	-36
23	19.2	11	15.1	14	13	8	-2	-14
24	21.0	11	16.8	11	14	10	3	-6

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.0	8	18.7	-3	7	10	8	4
2	24.9	10	20.0	4	12	13	10	5
3	22.0	13	17.4	12	15	14	8	1
4	19.6	15	15.5	18	17	13	4	-6
5	18.3	19	14.5	24	19	12	1	-11
6	17.5	22	13.8	29	21	12	-1	-15
7	16.6	24	13.2	30	20	9	-5	-21
8	15.8	28	12.4	30	18	7	-9	-26
9	14.9	27	11.6	29	16	3	-14	-34
10	13.5	28	10.5	25	9	-6	-26	...
11	12.0	30	9.2	21	2	-15	...	...
12	12.1	28	9.5	19	0	-19	...	...
13	11.7	29	9.2	18	-2	-22	...	...
14	11.5	23	9.0	14	-4	-22	...	...
15	11.3	16	8.8	10	-5	-21	...	...
16	10.6	6	8.1	4	-8	-23	...	...
17	9.9	-4	7.5	1	-9	-23	...	...
18	10.7	-7	8.1	0	-6	-16	-33	...
19	13.5	-3	10.6	-1	-1	-6	-17	-31
20	17.8	1	13.6	-6	2	1	-4	-13
21	21.4	3	16.6	-11	1	3	1	-4
22	23.8	5	18.7	-13	1	5	4	0
23	24.6	5	20.0	-13	2	5	5	2
24	24.9	6	20.6	-10	3	7	6	3

VK WEST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.8	11	19.4	13	17	14	9	1
2	24.1	11	20.0	13	17	15	9	1
3	24.3	11	18.2	14	17	15	10	2
4	24.2	11	20.2	16	18	16	10	2
5	24.1	12	20.0	19	20	17	11	2
6	23.7	14	19.1	25	23	19	11	2
7	21.9	17	17.5	30	25	19	9	-2
8	19.9	20	15.8	33	25	16	4	-9
9	17.7	23	14.0	33	22	11	-4	-20
10	15.8	25	12.5	31	17	4	-14	-34
11	14.1	28	11.2	27	11	-4	-25	...
12	13.2	29	10.4	25	7	-10	-33	...
13	12.4	30	9.8	22	2	-16	...	...
14	11.7	31	9.2	19	-2	-22	...	...
15	11.3	31	8.9	18	-4	-25	...	...
16	11.1	32	8.7	17	-5	-27	...	...
17	10.2	33	7.8	13	-11	-35	...	...
18	9.9	33	7.6	11	-15	...	...	...
19	9.7	29	7.4	8	-17	...	...	...
20	10.5	21	8.0	10	-10	-30	...	...
21	13.2	17	10.4	15	3	-10	-30	...
22	17.3	14	13.2	18	13	5	-7	-22
23	20.7	12	16.1	16	16	11	3	-7
24	22.8	11	18.1	14	16	14	7	-1

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.2	0	7.7	3	-3	-13	-30	...
2	10.7	3	7.4	4	-6	-18	-37	...
3	10.1	7	7.1	4	-9	-24	...	...
4	9.7	12	6.9	4	-13	-31	...	...
5	9.6	16	6.9	4	-15	-35	...	...
6	10.5	23	7.7	10	-10	-29	...	...
7	12.6	22	9.4	18	3	-12	-32	...
8	15.4	21	11.3	24	13	2	-12	-30
9	14.3	17	9.9	18	8	-3	-19	-37
10	12.1	12	8.7	11	1	-10	-28	...
11	11.5	4	7.9	5	-3	-14	-31	...
12	10.8	-3	7.4	2	-4	-15	-31	...
13	10.4	-11	7.2	0	-4	-13	-28	...
14	10.1	-16	7.0	-1	-4	-11	-25	...
15	9.8	-33	6.9	-11	-12	-19	-34	...
16	9.3	...	6.6	-22	-22	-31	...	...
17	9.1	...	6.5	-29	-30	-39	...	...
18	9.9	...	7.2	-22	-21	-27	...	...
19	11.9	-17	8.1	-6	-2	-6	-14	-25
20	15.1	-7	11.2	-10	-2	-3	-8	-16
21	15.7	-5	11.0	-10	-1	-2	-7	-15
22	14.1	-6	9.8	-6	-1	-3	-11	-21
23	12.9	-5	8.9	-2	-1	-8	-16	-29
24	12.0	-3	8.2	1	-2	-9	-22	-38

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.2	20	7.7	7	-13	-33	...	...
2	10.5	14	8.1	8	-7	-24	...	...
3	14.4	12	11.4	13	6	-3	-18	-35
4	20.0	11	15.5	13	13	10	2	-8
5	22.5	9	17.0	8	12	10	5	-3
6	22.6	8	19.0	5	10	9	4	-3
7	22.6	7	18.7	4	10	9	4	-3
8	22.2	7	18.2	3	9	8	3	-4
9	21.5	7	17.4	5	9	8	2	-6
10	20.0	8	15.9	7	10	6	0	-10
11	18.1	10	15.4	10	10	4	-5	-17
12	16.0	12	12.7	13	8	0	-13	-29
13	14.1	15	11.1	15	5	-6	-24	...
14	12.6	20	9.9	15	0	-15	-37	...
15	11.6	25	9.1	15	-4	-23	...	...
16	10.9	28	8.6	13	-9	-30	...	...
17	10.5	29	8.3	12	-12	-34	...	...
18	10.3	30	8.1	11	-13	-37	...	...
19	10.2	31	7.9	10	-15	-39	...	...
20	9.6	31	7.4	7	-20	...	...	...
21	9.1	32	7.0	3	-26	...	...	...
22	9.9	31	7.5	9	-17	...	...	...
23	10.1	31	7.8	11	-14	-38	...	...
24	9.4	27	7.2	5	-20	...	...	...

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.0	14	8.5	8	-8	-25	...	...
2	11.4	6	8.7	5	-5	-19	-39	...
3	15.3	5	12.0	5	4	-2	-14	-28
4	20.5	7	15.7	1	7	6	1	-6
5	23.2	6	17.6	-3	6	7	5	-1
6	23.2	5	19.4	-6	4	6	4	-1
7	23.2	5	19.2	-7	4	6	4	-1
8	22.9	5	18.7	-6	4	6	3	-2
9	22.2	5	18.0	-4	5	6	3	-3
10	20.8	6	16.7	0	6	6	1	-7
11	19.1	8	16.1	5	8	5	-2	-12
12	17.3	10	13.7	11	9	3	-7	-20
13	15.6	14	12.4	16	9	-1	-15	-33
14	14.2	19	11.3	19	6	-7	-26	...
15	13.3	22	10.6	20	3	-12	-35	...
16	12.6	24	9.9	18	0	-19	...	...
17	12.0	26	9.5	16	-4	-24	...	...
18	11.6	27	9.1	15	-7	-28	...	...
19	11.3	27	8.8	13	-10	-32	...	...
20	10.4	28	8.1	8	-18	...	...	...
21	9.4	29	7.3	1	-29	...	...	...
22	10.0	28	7.7	6	-22	...	...	...
23	13.0	26	10.1	21	2	-16	...	...
24	11.9	23	9.2	15	-2	-20	...	...

VK SOUTH SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.8	14	18.4	21	17	10	0	-14
2	19.9	14	16.9	21	18	11	0	-13
3	19.8	14	16.6	22	18	11	0	-14
4	19.8	15	16.4	24	19	12	0	-14
5	19.5	17	18.0	27	20	12	-1	-15
6	18.6	20	14.9	31	21	11	-4	-20
7	16.9	23	13.4	32	19	5	-12	-33
8	15.2	25	12.0	29	12	-3	-25	...
9	13.6	27	10.8	24	4	-14	...	...
10	12.2	29	9.7	19	-4	-26	...	...
11	11.1	30	8.8	12	-15	...	...	...
12	10.3	31	8.1	7	-23	...	...	...
13	9.7	32	7.7	2	-30	...	...	...
14	9.4	32	7.4	0	-35	...	...	...
15	9.2	32	7.2	-1	-37	...	...	...
16	8.5	34	6.6	-7	...	...	...	...
17	8.3	34	8.4	-10	...	...	...	...
18	8.0	34	6.1	-15	...	...	...	...
19	8.7	27	6.6	-7	...	...	...	...
20	10.8	20	8.1	7	-16	...	...	...
21	14.0	16	10.7	16	3	-11	-32	...
22	16.8	15	13.1	20	12	2	-13	-31
23	18.6	14	14.8	21	15	7	-5	-20
24	19.5	14	15.9	21	17	10	-1	-15

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.3	13	20.3	18	20	19	14	7
2	25.6	13	20.8	14	19	18	14	7
3	25.8	12	21.3	12	16	17	14	7
4	26.2	12	20.0	12	18	18	14	8
5	26.2	12	21.8	12	18	18	14	8
6	26.2	13	21.7	14	19	19	15	9
7	26.0	14	21.3	17	21	20	15	9
8	25.3	14	20.5	21	23	21	15	8
9	23.9	16	19.3	27	26	21	14	5
10	22.4	19	18.9	34	28	22	12	0
11	20.9	20	16.7	35	27	19	7	-6
12	19.3	21	15.3	35	24	14	0	-15
13	17.9	21	14.2	33	21	9	-7	-25
14	17.0	23	13.5	33	18	5	-13	-34
15	15.9	23	12.6	30	13	-1	-22	...
16	14.7	23	11.7	26	7	-10	-34	...
17	13.8	24	10.9	22	1	-17	...	...
18	13.2	24	10.3	19	-3	-24	...	...
19	11.9	25	9.3	12	-14	...	...	...
20	10.4	25	8.0	0	-34	...	...	...
21	10.8	25	8.3	4	-27	...	...	...
22	14.5	21	11.5	23	5	-11	-35	...
23	19.9	15	15.4	23	18	12	1	-12
24	23.7	14	18.7	20	21	18	11	3

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.3	7	19.7	-12	3	7	7	3
2	23.1	8	18.3	-6	6	9	7	3
3	20.2	9	16.0	0	8	8	4	-2
4	17.9	10	14.2	7	10	7	1	-8
5	16.7	13	13.2	12	12	7	-2	-14
6	15.8	17	12.5	18	13	6	-5	-19
7	15.0	21	11.9	23	14	4	-10	-26
8	14.5	26	11.3	26	15	3	-13	-32
9	13.7	28	10.7	27	13	0	-19	...
10	12.7	30	9.8	25	9	-6	-28	...
11	11.6	32	8.9	22	3	-14	-39	...
12	12.4	31	9.5	25	7	-8	-31	...
13	12.6	30	10.0	24	7	-10	-33	...
14	11.9	26	9.4	19	2	-14	-38	...
15	11.6	20	9.2	14	0	-15	-38	...
16	11.5	13	9.0	11	0	-14	-35	...
17	11.3	5	8.8	7	-1	-13	-30	...
18	10.6	-3	8.2	3	-3	-14	-31	...
19	9.9	-12	7.6	1	-4	-14	-30	...
20	10.7	-13	8.1	0	-2	-9	-23	-39
21	13.5	-6	10.7	-4	0	-3	-11	-23
22	17.8	0	13.7	-10	0	1	-2	-9
23	21.4	3	16.7	-15	0	3	2	-1
24	23.4	5	18.7	-15	0	5	5	1

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● ACCOUNTING SOFTWARE designed by Banking professionals, suitable for Small Businesses, Clubs, Membership Societies, and personal applications. Easy to operate, no special skills required. Financial reports include Cashbook, Profit/Loss, Balance Sheet, General Ledger, and Bank Reconciliation. User amendable Chart of Accounts built-in. Includes manual and on-line support, $265-00. Stand-alone Invoices module, $240-00. Fully Integrated system of Accounting with Accounts Receivable and Payable, $535-00. General business services, Hardware, LANS etc at competitive prices. 5% discount off all software for AR readers who quote this advert. Samples and demo disks ($10-00, refundable on sale) available.

● BOOKMATE COMPUTER SERVICES PTY LTD, 6 Ann Court, Aspendale Vic 3195 (03) 580 6424 Fax (03) 580 8380 (VK3UV) A.C.N. 005 420 548.

FOR SALE NSW

● DECEASED ESTATE VK2BDS. ICOM IC735 HF trxcvr c/w mike manual and access $1000; ICOM PS55 psu $400; YAESU FT7B HF trxcvr $500; YAESU FL2000B HF linear $1000. Elsie (047) 74 1084.

● YAESU FT-7 mobile HF txcvr (S/N 81090459) incl mic power cable for 12 V mounting bracket & handbook $350 ONO. YAESU FC-707 antenna tuner (S/N 2F190315) 80 M — 10 M (incl WARC bands) built-in SWR and power meter 50 Ω dummy load, handbook $200 ONO. Bruce VK2DEQ QTHR (063) 628 703 fax (063) 627 950.

FOR SALE VIC

● Shack clearance — ICOM PS-15 20 amp PSU new $300; H/B PSU 12 V 30 plus amps, but needs regulator $50; TET LPQ-4 compact 40/10 m trap antenna, use indoors or out, new $75; MFJ 704 low pass filter $40; MFJ 260B 300 W dummy load $40; HI MOUND HK 706 key $25; YAESU SP-902 spkr EC $50. Ron VK3OM QTHR (059) 44 3019

● ICOM IC2SA 2 metre handheld with charger, as new $285; AEA half wave telescopic whip $35. Ken VK3NJ (03) 561 4124.

● ANTENNA Hy-gain model 204BA, four element 20 metre full sized beam, 9.7 dB gain, 25 dB front to back, with instruction manual, needs repair $150 ONO. John VK3GF QTHR (055) 62 5545.

FOR SALE QLD

● LAMBDA 80 amp 15 volt p/s; 3BZ tx vgc with manual; RATCLIFFE rf and af signal generators; ELECTRONIC keyer; A & R 12 volt 6amp switchable bench p/s; BIRD 43 wattmeter, dummy load, 3-30MHz and 3 vhf slugs; HF LINEAR and HV p/s components; VALVES 807, 6DQ5, 6DQ6, 572B, 813, 6146B, 2.5/300 with ceramic bases and anode caps; OLD MICROPHONES and headsets; 1921 GENUINE xtal set; 100W PHILIPS amplifier; 1937 AWA 5w amplifier; MARINA 60 txcvr; HOMEBREW 2x807 tx with Geloso vfo; WESTON LM5 txcvr vgc; WESTON LM6 txcvr vgc; TX valves; 100w Hf tx; RADIO and hobbies 1941-1962; AR88 rx; FT100 txcvr; RAAF DC3 headset. All items price negotiable, valves half new price, will exchange all or any of the above for W.H.Y. "Doc" VK4CMY (076) 85 2167 AH.

● IC2HA Digitally controlled HF all band antenna tuner, brand new, in original box, fits directly to IC735 $550. Charlie VK4BQ QTHR (077) 79 1357 BH (077) 79 4301 AH.

● VALVES transmitting, receiving, renovators, collectors, some unused, tested. Octals, early and later types, rectifiers, sockets. Send s.a.e. A4 envelope for latest increased list. Ted VK4YG PO Box 245, Ravenshoe, QLD 4872 (070) 976 387.

● ADMIRALTY handbooks wireless telegraphy 1938, vol 1, magnetism, electricity, vol 2, radio, aerials, propagation etc. collectors item or enjoy reading $30. Les VK4DA QTHR (071) 52 5045.

WANTED ACT

● MOBILE mount for Yaesu series one FT290R and Kenwood MC-50 or MC-60 microphone. Deane VK1DW (06) 288 5018 AH.

WANTED VIC

● MODERN 2 metre mobile rig, also 12 amp power supply. Ken VK3NJ (03) 561 4124.

● EMTRON EAT300 or 300A ATU. Ron VK3OM QTHR (059) 44 3019

WANTED QLD

● SCHEMATIC diagrams for Collins 618T-IB aircraft txcvr. Photocopy ok if clearly readable. Note ARC-94 and ARC-102 are equivs. Cliff VK4QJ QTHR.

● ORIGINAL or photocopy FLDX2000 amplifier manual pay costs incurred; HEATHKIT or YAESU monitorscope; MANUAL "bug" speed key; 1950s 1960s ARRL handbooks. "Doc" VK4CMY (076) 85 2167, Via PO Dalveen Old 4374.

● TEN-TEC Delta tcvr must be vgc with manual no mods. Will consider drake or heath equivalent. Dick VK4GOR QTHR (07) 379 1600.

● 800 MHz wide band fm tx or RL900 AWA unit. John VK4TL QTHR (070) 96 8328.

WANTED SA

● FT107 in good cond with or without inbuilt psu. Dale VK5AFO QTHR (08) 391 2300.

MISCELLANEOUS

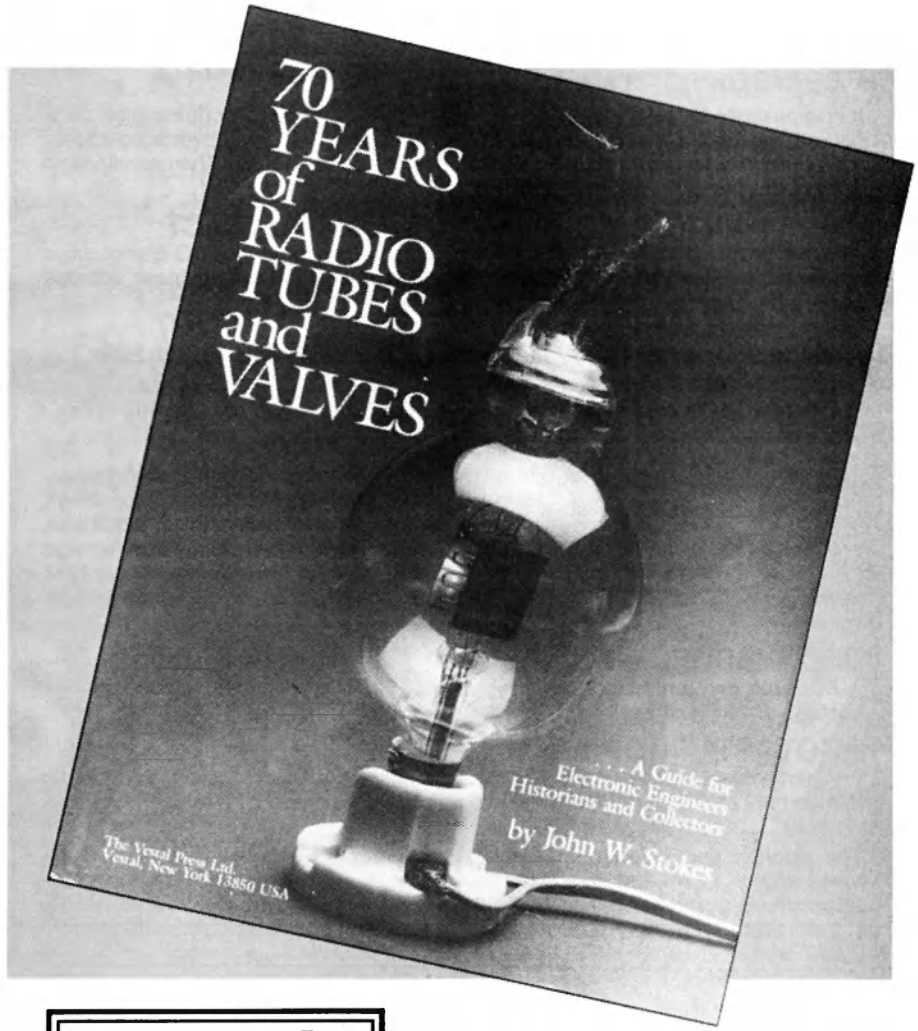
● PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

ar

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse side of the Amateur Radio Address Flysheet.

Historical Book Review

Another in the series of brief reviews by Colin MacKinnon VK2DYM of books published over the years which deal with the history and technical development of radio and radar in Australia. Most were printed in limited numbers and are sometimes hard to find.



70 Years of Radio Tubes and Valves

Written by John W Stokes —
ISBN 0 911572 27
Subject — Technology and history of tubes and valves

John Stokes has produced a definitive technical catalogue of valves, or tubes if you prefer. It details the valves made by AWA and STC. Anyone interested in Australian radio technology will benefit from the many photos and details of valves used in Australian radios.

The book is A4 and has 248 pages. I believe it sold for around $40.00

Colin VK2DYM
ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
•Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
•Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
•Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
•QTHR means address is correct as set out in the WIA current Call Book.

•WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
•Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958
MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

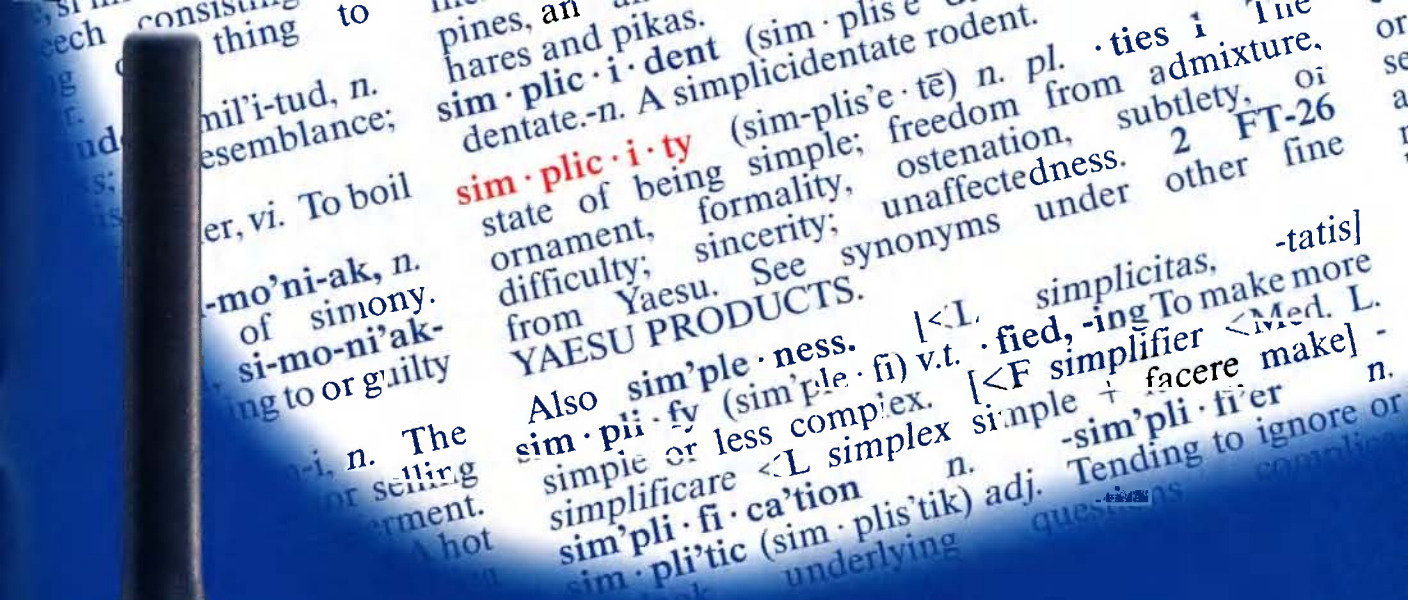
.....

State and Postcode:.....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026



Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

A simply brilliant price

Cat D-3600

$449

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

Ham heaven.

Some days Duncan thinks that he must have died and gone to heaven. Whichever way he turns he is surrounded by the finest ham radios around. What's a guy to do? He plays with them all day. And if that wasn't good enough, he gets paid for it as well.

Duncan Baxter...well VK 3LZ actually, let's call him by his 'real' name, is our resident ham radio expert. No one knows the Icom range better than VK 3LZ. He's been with us virtually from the start, some ten years in fact.

Now, if you'd like to find out about the latest in base stations, or virtually anything else to do with amateur radio operation, why not give VK 3LZ a call. Or you could simply drop in and see him at ham heaven ... err ... our head office that is.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call: (008) 338 915 Ph: (03) 529 7582 Fax: (03) 529 8485 A.C.N. 006 092 575

LL BROWN ADVERTISING 4668

AMATEUR RADIO

OCTOBER 1993
Volume 61 No 10

Journal of the Wireless Institute of Australia

IN THIS ISSUE:

HOW TO BUILD —

A TRANSCEIVER FOR 80 METRES
A VOICE REPEATER CONTROL UNIT
A SWITCHED MODE POWER SUPPLY
COAXIAL CABLE TRAPS

KENWOOD

...pacesetter in Amateur Radio

Compact Milestone

Kenwood unveils the world's smallest HF transceiver

HF is going places—thanks to Kenwood's new TS-50S, the smallest transceiver of its kind in the world. Providing high-performance communications with go-anywhere convenience, the TS-50S is your passport to freedom. And whether used for mobile operations and DX-peditions or in a fixed installation, this rig packs a powerful punch. Maximum output is 100W, and there's a full range of advanced features—including 100 memory channels, DDS with innovative "fuzzy" control, and AIP for superior dynamic range IF shift and CW reverse mode help reduce interference, while a noise blanker improves clarity. For user-friendly operation on the move, there's a multi-function microphone and powerful menu system. And the TS-50S is fully equipped for split-frequency operations. Test drive one today.

TS-50S
HF TRANSCEIVER

NEW

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY LTD
(ACN 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre
Homebush, NSW 2140. Australia Tel (020 746 1519
Fax. (02) 746 1509
NSW Emona Electronics Sydney (02) 211 0988
Lake Macquane Communications Cardiff (049) 567 255
ACT Watts Communications Fyshwick (06) 280 6416
QLD Kenwood Communications Albion (07) 357 6830
VIC Strictly Ham Bayswater (03) 729 7656. Stewart
Electronics Components Huntingdale (03) 543 3733
SA International Comms Systems Port Adelaide (08) 473 688
WA Leda Electronics St James (09) 361 7821
Tower Communications, Victoria Park (09) 470 1118
TAS Elgin Pty Ltd Launceston (003) 312 711,
Elgin Pty Ltd Hobart (002) 344 5000

FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

Journal of the Wireless Institute of Australia

Vol 61 No 10 ISSN 0002-6859 October 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191
Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
November	11/10/93	13/10/93
December	08/11/93	10/11/93
January	29/11/93	01/12/93

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Technical

Operating

Contests

Columns

Cover

The neat and compact little 80 metre transceiver described by Drew Diamond VK3XU, commencing on page 4 of this issue. Yes, it is still possible for the home-builder to compete with commercial gear on 80 m SSB.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

Federal Secretary
Bruce Thorne
Office Manager
Donna Reilly

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Federal QSP

As I sit once again to put fingers to keyboard, we are between two of the more popular events on the amateur calendar. The Remembrance Day Contest has been and gone for another year. I was able to put in a very limited time to operating in this year's contest due to an interstate trip and other commitments on that weekend. However, in the limited time available, sufficient contacts were made to be able to put in an entry. By the time you read this, the deadline for submission of cover sheets to the contest co-ordinator will have passed so I hope that all who participated were able to get their sheets posted in time. Judging from what I observed in my limited time on air, the RD contest once again lived up to its name of the friendly contest. Participation is the key to a Division's winning the RD Contest Trophy. We must now all await the contest co-ordinator's decision to see which was the successful Division this year.

Participation is also the key to another event which comes up this month. I speak of JOTA, the Jamboree on the Air. To many this will have already caused groans and moans. It can be a trying time for both those who choose to assist as well as those who try to go about their normal operation on the JOTA weekend. There is something about trying to control a bunch of young people at the microphone. Young voices also sound so strange on the radio, largely because we are not accustomed to their presence.

But, all that aside, JOTA presents the amateur fraternity with an opportunity to expose more young people to amateur radio and, hopefully, convince them that life is not all about just computers and the latest game craze, but that there are other equally rewarding hobby pursuits. When you are approached by your local JOTA co-ordinator to assist in manning or setting up a JOTA station, think twice before declining. In these times of increasing pressure on the available RF spectrum, we need to make the most of every opportunity to attract others to our hobby. Like many such efforts, of the hundreds who will pass through and operate a JOTA station, only a very few will go on to pursue radio as a hobby, but each one helps.

We need to show to all those youngsters who do participate that amateur radio is something interesting. Many young people, and older people for that matter, tend to go silent when confronted with a microphone, so you need to do all you can to assist them to get over their mike shyness. If you are the operator assisting, have a cheat sheet ready of things to say and ask. If you are in contact with a JOTA station, do all you can to make it easy for those on the other end of the contact by remembering what your first contact was like and how you felt.

Some of this might sound like I'm beating the same old drum, but one of the things we all need to do is encourage others to take up this hobby. As many others more noteworthy than I have said about our bands, "Use them or lose them". That means being active ourselves as well as encouraging others to join us as amateur radio operators and also "using them".

Next month you will get a break from my words as I will be on holidays overseas and Neil Penfold VK6NE will be filling in for me.

Kevin Olds VK1OK
Federal President
ar

WIA News

Sexual Harassment by Radio, Man Fined

A Shepparton, Victoria, man found himself considerably poorer and minus a few transceivers after he was caught and charged over sexually harassing a woman over the air.

Adrian Lindsay Coyne of Shepparton was identified as making a number of sexually explicit and offensive remarks on a CB transceiver in September last year, the Shepparton Magistrate's Court was told in a hearing last April.

On the charge of harassment, Coyne was fined $500. He was also fined a total of $1000 on two counts for possession of unlicensed CB rigs. He had to forfeit the transceivers and pay court costs of $224.80.

Senior Technical Officer for the Department of Transport and Communications, Rodney Champness (VK3UG), said that the Department (now the SMA) would continue policing this type of offensive behaviour and that the fine should be a warning to others that anti-social behaviour on air would not be condoned.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts		1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Roger Harrison Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2ZTB	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLV	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North,(146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to ***Australian resident*** (F) (G) (X) grades at fee x 3 times.

"TCF" Sideband/CW Transceiver for 80 Metres

Drew Diamond, VK3XU describes an 80 metre transceiver for you to construct.*

"TCF" Transceiver.

Here are details of a relatively simple SSB/CW transceiver for the popular 80 metre band which may be built by the amateur without fancy test equipment. The availability of cheap computer grade crystals, and the utility of the NE602 balanced mixer/modulator IC, has made home construction of moderate performance receivers and transmitters much easier than in the recent past. Complexity and parts count has been kept to a minimum without sacrificing satisfactory performance. Transmitter and receiver sections have individual circuit boards, so these may be built as separate items (with small adaptions), or in stages, as desired. The prototype has the following measured characteristics:

Receiver

Frequency Range:	Nominally 3.5 to 3.9 MHz
Sensitivity:	0.5 μV for 10 dB S+N:N
Reception Modes:	SSB, CW, DSB and AM (as SSB)
Image Rejection:	70 dB
IF (6 MHz) Rejection:	60 dB
Incremental Tune (RIT):	Nominally +/–3.5 kHz
Frequency Stability:	Less than 100 Hz in any hour after warm-up

Transmitter

Frequency Range:	Same as receiver
Power Output:	At least 2 W, typically 4 W into 50 ohms
Modes:	SSB (LSB) and CW
Carrier Suppression:	35 dB
USB Suppression:	35 dB
Harmonics and Spurs:	At least –52 dB at full output
Frequency Stability:	Same as receiver
Load Tolerance:	Withstands any load SWR without damage
Power Supply:	Nominally +12 VDC at up to 1 A

Circuit

The receiver section is in the lower half of the schematic. The VFO and crystal oscillator, which are common to both the receiver and transmitter, are shown in the centre. Transmitter is in the top portion.

An IF of 6 MHz was chosen for several reasons; the crystals are cheap and widely available, the VFO frequency is a reasonable one (satisfactory stability is obtainable at 9 MHz without heroics), 6 MHz crystals can be pulled fairly easily, and no bothersome spurs are produced. 5 MHz must be avoided because of the possibility of IF breakthrough from the powerful VNG signals on that frequency. Complexity is avoided by using identical Twin Crystal Filters (TCF), one each for transmit and receive functions.

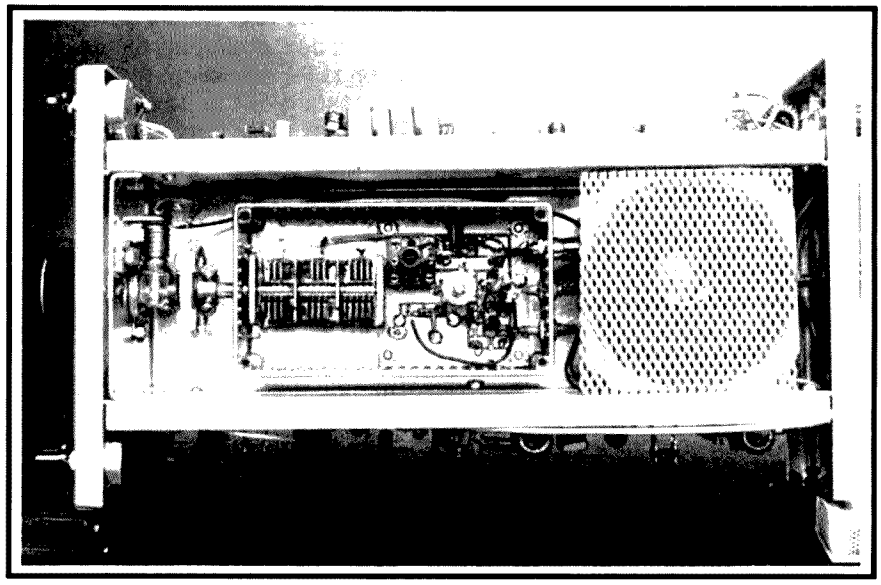
Receiving

Signals in the 3.5 to 3.9 MHz range are admitted via the top-coupled band pass filter, and applied to one of the NE602 inputs at pin 1 of the receive mixer. The VFO is adjustable from 9.5 to 9.9 MHz, and is injected into the oscillator port at pin 6. The wanted product (IF at 6 MHz) must negotiate the 4-crystal ladder filter. Bandwidth is determined by the value of the five coupling capacitors — 33 pF yields a bandwidth of about 1.8 kHz. The filtered 6 MHz signal is again presented to an NE602 as product detector. The crystal derived oscillator (BFO) signal of about 5.9998 MHz is applied to the oscillator port at pin 6. The 6.0 MHz oscillator crystal is pulled about 200 Hz low with a 10 μH coil to place it on the lower edge of the crystal filter bandpass, thus providing reception of LSB signals on SSB (the polarity of the sideband is reversed by the VFO mixing process), and single-signal reception of CW signals. The product of this action, low level AF, is applied to a conventional '741/'386 audio amplifier to power speaker or 'phones.

The NE602 was designed originally by Signetics for cellular radio applications, and has a 500 MHz input bandwidth. During breadboarding of this project it was found that TV and FM signals could enter the receiver (the transmitters are only a few km from here), mix with

the local oscillator VFO, and produce a few sub-microvolt spurs. A solution was simple; route the input receive signal via the transmitter's low-pass filter, which also improves IF rejection.

For CW operation, and to allow for small netting errors on SSB, incremental tuning is provided on receive with a diode and capacitor at the source tap of the VFO. The effective value of capacitance is altered by varying the forward current through the diode. A 470 ohm resistor is switched in on transmit to bias the diode to the same nominal current level as at the mid point of the 1 kohm offset pot, which is sourced on receive.



VFO and Dial Assembly.

Transmitting

Microphone audio is amplified and applied to pin 2 of an NE602 wired as a balanced modulator (input pins 1 and 2 are interchangeable, as are the output pins 4 and 5). "Carrier" at about 5.9998 MHz is applied to pin 6. The normally excellent balance is upset at audio rate, thereby producing double sideband (DSB) at the output of the balanced modulator. Static DC conditions of the '602 may be altered with high value resistors and a trimpot connected between pins 1 and 2, thus allowing for carrier balance adjustment. For CW operation, the '741 mike amplifier is unpowered, and balance is upset by inclining one side of the '602 input to ground. Rise/fall time constant is determined by the value of C at pin 1 — 1 μF — and series R — 22 kohm — resulting in click-free CW keying. Back-wave on CW is about the same as carrier suppression — −35 dB.

The DSB or CW signal emerging at pins 4 and 5 is applied to a second crystal filter, which passes the USB only, the LSB being greatly attenuated. Another '602 doing transmit mixing duty has VFO applied at the osc port where our 6 MHz SSB or CW signal is heterodyned as follows:- 9.5 — 6 = 3.5 MHz, 9.9 — 6 = 3.9 MHz. Once again, the VFO mixing process inverts the sideband polarity from USB to LSB, the convention for 80 m SSB.

The resulting SSB or CW signal is raised in discrete increments through a three stage linear amplifier to about 3 W. A seven pole low pass cleans up any harmonics which may be (and probably are) present at the drain of the output power MOSFET, and on reception also provides attenuation of all signals above about 5 MHz.

Construction

Equipment required: The usual electronics hand tools, drill-press (not essential), multimeter (preferably digital), power meter/load (or lamp), 80 m receiver, frequency counter and/or general coverage receiver.

The set must be housed in a metal box, so that external RF fields cannot enter and cause instability problems. My home made assembly measures 285 × 163 × 85 mm (11 × 6.5 × 3.5 inches approx). Good rigidity and compactness is obtained by using three internal sub-chassis panels as shown. Most components are accommodated upon three home-made circuit boards, which are receiver, VFO and transmitter. The first breadboard model was blobbed up "ugly" style on pieces of circuit board, which worked quite well. So we may assume that any of the current popular RF methods will work, provided that signal carrying wires and by-pass leads are kept reasonably short, and a circuit board ground plane is used. If only the receiver, or transmitter sections of this project are required, then it is only necessary to build that part, plus VFO and crystal oscillator (the crystal osc is located on the receiver board). As a transceiver project, I suggest that items should be constructed in the order of:- VFO, power supply (if required), receiver, then transmitter.

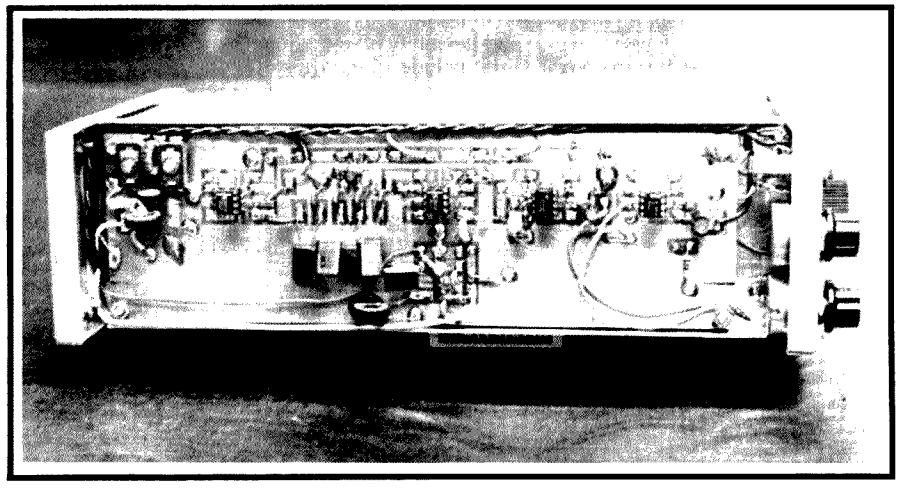
Constructors generally agree that a home-made VFO should be housed in a metal box, preferably die-cast. In addition to RF shielding, the thermal time constant of the box is so long that the oscillator tank is effectively buffered from any short term temperature excursions. A further useful degree of isolation may be had by mounting the box upon insulating material, or insulated spacers.

The VFO tank coil is wound on a standard 8 mm (5/16") former, the kind with four or six tags is ideal. Drill a 1 mm hole across the diameter of the former, 17 mm from the base. Uncoil about 1 m of 24 B&S wire from your spool, then fix the spool in a vice. Solder the wire to the tag corresponding to the ground end of the coil (check the circuit board layout). Whilst maintaining tension on the wire, walk towards the vice and wind on seven turns, then pull out sufficient wire to twist up a little pig-tail loop, which is the source tap. Now wind on the remaining 20.5 turns, making sure that each turn lies right next to the last, maintaining tension all the way. Cut the wire with about 50 mm spare, then carefully (this is the tricky part) poke the wire through the 1 mm hole, then pull through to keep tension on the coil. Solder the "hot" end of the coil to the appropriate tag. The coil should be coated with Q-Dope (TM), Estapol (TM) or shellac.

The variable capacitor shown is a 17/17/22 pF Alps unit available from some suppliers (see Parts). Only one gang, a 17 pF, is required. For a quality VFO, use the best constructed 15, 17 or 20 pF variable capacitor that you can find, NP0, polystyrene or silver mica capacitors in the VFO tank (avoid ordinary or unmarked ceramics for VFO applications), and an air dielectric trimmer. The components associated with RIT may be located on a small 5-tag strip soldered to the feed-through capacitor which carries RIT current into the VFO box.

The frequency dial consists of a disc of 3 mm opaque perspex, machined in a drill press using a tank-cutter. A hole-saw would also serve. Temporarily fix a bolt and nut through the resulting centre hole, and reduce the disc diameter by mounting it in the chuck and applying a flat file to the outer edge of the rotating disc. The clear perspex "window" has slightly larger diameter than the dial disc, and is fitted into the front panel. By the same method, but with the file tilted, put a slight taper on the outer diameter of the window disc so that it is a nice friction fit into the front panel. The planetary drive is mounted upon a right-angle formed in a sub chassis. To take up any small mis-alignment, the drive should be connected to the variable capacitor with an insulated flexible coupler. A short length of 6.35 mm (1/4") inside diameter rubber fuel hose clamped between drive and capacitor is a workable second best. The dial disc may be illuminated with a 12 V dial lamp placed so that light is radiated through a 10 mm hole from behind. A cursor line is formed by positioning a length of wire between lamp and dial, thus projecting a line onto the dial.

Power supply may be internal, or



Transmitter Board.

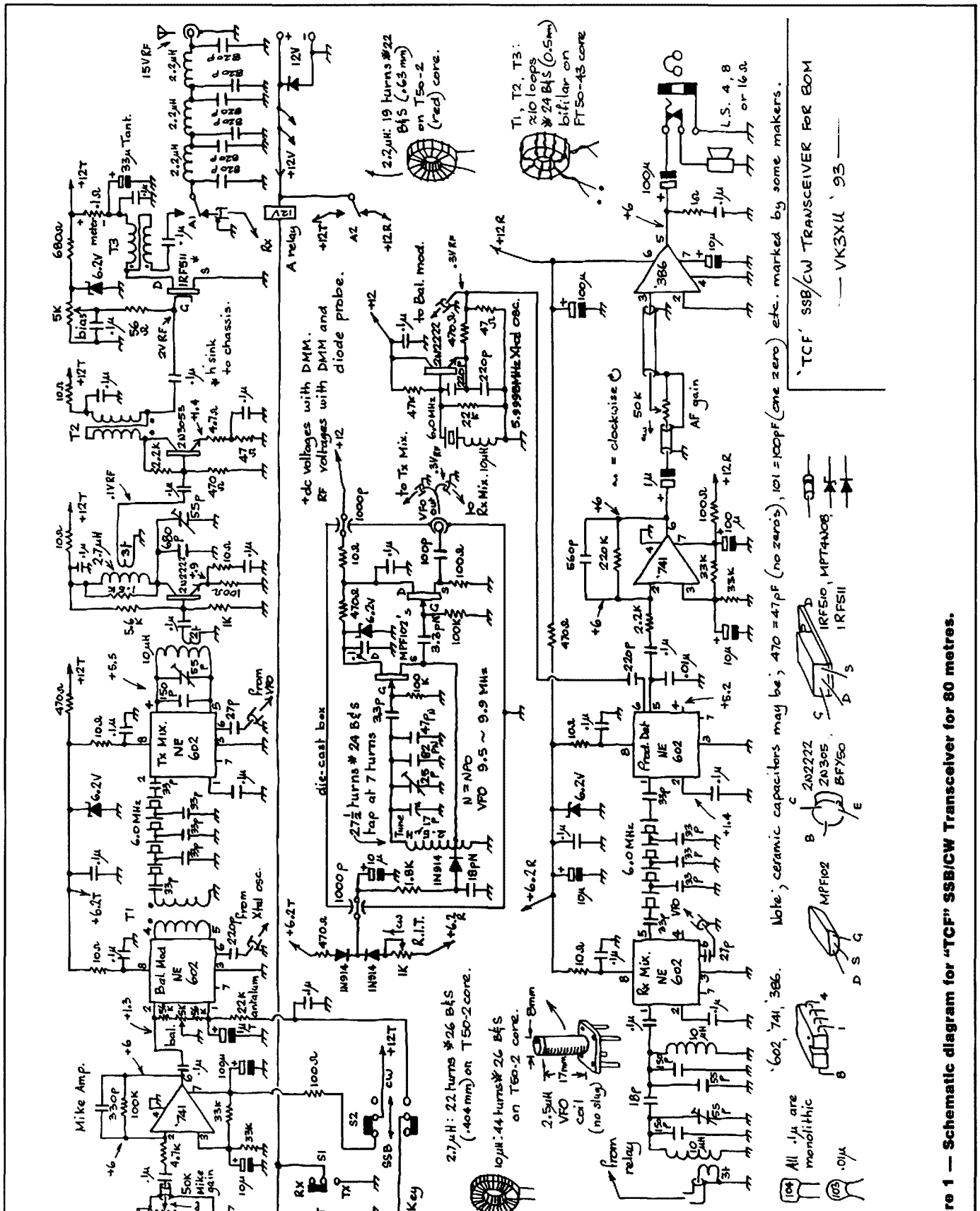


Figure 1 — Schematic diagram for "TCF" SSB/CW Transceiver for 80 metres.

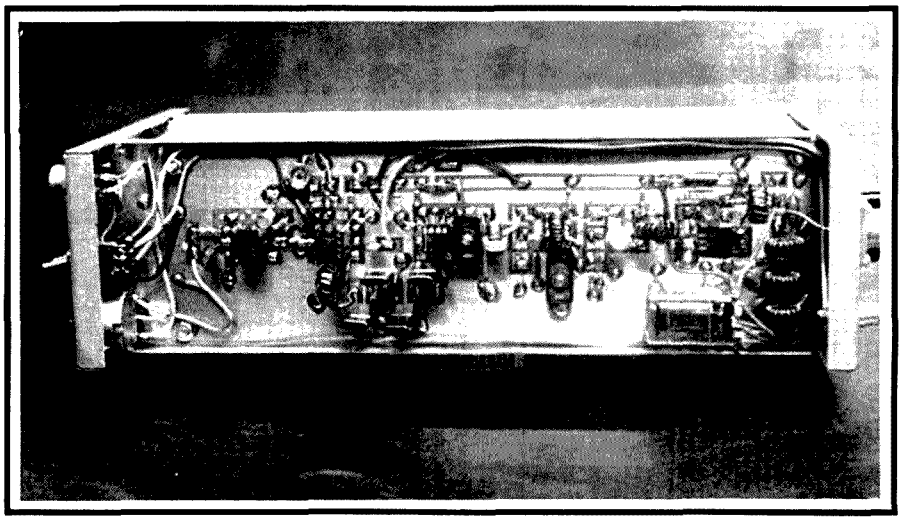
external to suit requirements. If accidental wrong polarity is possible (eg battery), connect a 1 A diode in reverse across the power input terminals, and series connect a 1 A fuse between positive battery supply and the set.

Bifilar broadband transformers T1, T2 and T3 are made as follows. Take two 300 mm lengths of 24 B&S wire, twist together at one end, and clamp that end in a vice. Twist the free ends together, and clamp in the chuck of a hand drill. Whilst maintaining tension, turn the drill until you have about three twists per cm, then pull the drill to set the pair. Now carefully loop the pair onto an Amidon FT50-42 core. About 10 loops should fit comfortably. Snip the ends leaving about 2 cm free. Remove about 1 cm enamel from each wire, and with a multimeter set on ohms, identify the "windings'. For T2 and T3, connect the end of one winding to the start of the other as shown on the circuit. Most toroidal transformers and coils are self-supporting. However, the 10 μH coils may be fixed to the board with a small blob of non acid silicone glue.

Several different brands of crystals were tried for the crystal filters and oscillator. The most satisfactory and reasonably priced were those branded QIC from Rod Irving Electronics. For best chance of success, it is strongly recommended that you use these also. Do not mix different makes of crystal in any one filter.

The IRF511 output amplifier must have an effective heatsink. A rectangular hole is cut in the circuit board so that the MOSFET may sink excess heat directly into the chassis. Remember to fit insulating hardware at the device/chassis interface. A solder tag under the mounting nut provides the drain connection. The source pin is soldered direct to the foil, then drain and gate pins are bent up at right angles to clear the board.

Although it is handy to have an in-built ammeter to monitor the PA drain current, meters are rather expensive, and once the standing current bias has been set up, there is rarely need to touch it again. The current drawn by the remaining circuitry (excluding dial lamp) is insignificant. So, if the power supply is external, and has its own meter, then none is required for the transceiver. In the absence of a metered supply, a 0.1 ohm resistor in series with the drain supply line allows us to connect a multimeter across it and check the current. 150 mA will therefore cause 0.015 V to be dropped, 900 mA drops 0.09 V, and so on. Most DMM's will easily read these values.



Receiver/Crystal Oscillator Board.

Alignment

Receiver: The VFO range must first be defined. If a counter is available, simply connect the VFO to the counter input and measure the frequency. Adjust the 25 pF VFO trim capacitor so that a range of less than 9.5 MHz to over 9.9 MHz is generated. Check that the RIT pot gives a smooth receive frequency adjustment of about 3.5 kHz each side of mid pot travel. If for some reason, the correct range cannot be obtained, change one of the VFO NP0 tank capacitors, larger or smaller as required.

No counter? Listen for the VFO signal on a general coverage receiver and adjust as described above. A short clip lead inserted in the VFO output connector should radiate a detectable signal. Adjust frequency and check stability with the VFO cover in place. With the perspex window removed, the dial may be calibrated by applying rub-on numbers at (say) 100 kHz increments.

Connect an antenna to the input. Peak the two 55 pF trim capacitors at the receiver input filter for best sensitivity/flatness across the band. The receiver should be responsive. At moderate loudness, SSB and CW signals should sound clean, without perceptible distortion or hum.

Transmitter: Set the MOSFET bias pot for minimum voltage, and the VFO to 9.6 MHz (to produce 3.6 MHz). Connect the output to a 50 ohm dummy load (a 12 V 5 W auto lamp will do). Disconnect any dial lamp if you are doing your current measurement with a power supply ammeter. Select CW mode, and switch to send. Adjust the MOSFET bias voltage for about 150 or 200 mA of standing (no signal, or "idling") drain current. Close the Morse key. Current should increase. Adjust the 55 pF trim capacitors at Tx Mix and the collector tank of the 2N2222 amplifier for maximum RF output. Current should now be about 900 mA, giving about 2 to 4 W RF output across the band. Open the key. Whilst listening to the signal on another receiver, adjust the "bal mod" pot for carrier null. You should obtain a clearly defined null as the carrier is balanced out. The signal at the test receiver must not be so strong that the null is masked. CW keying should sound crisp and be free of clicks and chirps.

Plug in a radio type PTT dynamic microphone. Whilst talking, increase the mike gain pot until the drain current flicks up to about 900 mA on voice peaks. Listen to the SSB signal on another receiver (don headphones to avoid feedback). It should sound

clean, and be free of splatter, clicks, hum, or other unpleasant noises. If an oscilloscope is available, view the RF waveform. It should have nicely rounded peaks, without bright spots anywhere on the envelope, and no significant "carrier" with mike gain at minimum.

Set the RIT pot to mid travel. On transmit, measure, as precisely as you can (preferably with a DMM), the voltage at the junction of the two 1N914s. Now switch to receive. Adjust the RIT pot to read exactly the same voltage, then slacken off the RIT knob grub screw and position the pointer to a calibration mark at 12 o'clock. Transmit and receive frequencies will now be the same at the nominal mid point of the RIT pot.

In actual use, when contact has been established with another station, any necessary receive frequency adjustments must be made with the RIT pot — leave the main VFO control untouched. When operating CW, about 1 kHz RIT offset will be necessary to obtain a pleasing "beat note".

An After-burner

Three watts with a full-size dipole has yielded good interstate and ZL SSB and CW contacts at night, although the going has sometimes been rough under noisy conditions. The output power may be boosted with a linear amplifier. One similar to the 25 W job described in Reference 6 is suggested, with the addition of a relay with two sets of change-over contacts to by-pass the amplifier during receive.

Parts

All conventional components are available from the usual electronics suppliers. The crystals were purchased from Rod Irving Electronics (03) 543 7877. In addition, radio type components may be ordered from Stewart Electronics (03) 543 3733, Truscotts Electronic World (03) 723 3860, and Electronic Disposals (03) 723 2699. These firms will answer mail orders. VFO capacitor, pots, Amidon cores and trim caps were purchased from the latter two vendors. Amidon suppliers also advertise in the Hamads of this journal. Perspex and printed circuit board may be obtained from electrical insulation merchants (eg O H O'Brien, South Melbourne). The planetary reduction drive came from Dick Smiths.

More Information

Some relevant DC and RF voltages are shown on the circuit to aid in any necessary troubleshooting. Voltages which differ greatly should indicate the problem area. If, after earnest efforts, you cannot get your project to work satisfactorily, or require more information, including circuit board "artwork" and component location diagrams, please write to me at the address above, and all reasonable assistance will be gladly returned. An appropriately sized SASE would be appreciated.

References and Further Reading

1. NE602 Primer — Carr, Elektor Electronics, Jan '92.
2. Sideband Can Be Simple! — Price G4BWE, RadCom, Sep '91.
3. A Miniature SSB Transceiver — Grierson G3TSO, RadCom, June/July '91.
4. QRP SSB/CW Transceiver for 14 MHz — Hayward W7ZOI, QST, Jan '90.
5. Designing and Building Simple Crystal Filters — Hayward, QST, July '87.
6. 25 W MOSFET Linear Amplifier — Diamond VK3XU, AR Jan '91.
7. Some Practical Tips on VFO Construction — Diamond, AR Jan '88.

Parts List for the "TCF" Transceiver

Capacitors all 16 V or greater	Qty
3.3 pF NP0	2
18 pF NP0	2
17 pF variable (see text)	1
25 pF "beehive" air trimmer	1
27 pF NP0	2
33 pF NP0	10
47 pF NP0	1
55 pF compression mica trimmer	4
150 pF polystyrene	3
220 pF polystyrene or ceramic	4
330 pF ceramic	1
560 pF ceramic	1
820 pF polystyrene (avoid ceramic)	6
1000 pF feedthrough	2
0.01 µF ceramic	1
0.1 µF monolithic	28
1 µF electrolytic	1
1 µF tantalum	1
10 µF electrolytic	5
33 µF tantalum	1
100 µF electrolytic	4
Resistors all 1/4 or 1/2 W	
0.1 ohm	1
1 ohm	1
4.7 ohm	1
10 ohm	8
47 ohm	2
56 ohm	1
100 ohm	4
470 ohm	5
680 ohm	1
1 kohm	1
1 kohm linear pot	1
1.5 kohm	1
2.2 kohm	2
4.7 kohm	1
5 kohm flat mount trimpot	2
5.6 kohm	1
33 kohm	4
47 kohm	1
50 kohm log or linear pot	2
56 kohm	2
100 kohm	3
220 kohm	1
Semiconductors	
MPF102, 2N5457, etc.	2
2N2222, 2N3904, etc.	2
2N3053, BFY50, etc.	1
IRF510, IRF511, MTP4N08 etc.	1
NE602AN	4
LM741	2
LM386	1
6.2 V 400 mW zener	4
1N4148 or 1N914 diode	3

Miscellaneous

Case to suit, or sheet aluminium to make, die cast box 120 x 65 x 36 mm, Amidon T50-2 cores (8), FT50-43 cores (3), QIC brand 6.0 MHz crystal (9, all identical), 6 or 4-pin 8 mm bakelite coil former, dial drive, coupler, perspex, 12 V lamp & holder, 8-pin DIL wire wrap sockets (7), single or double-sided circuit board material, speaker, mike socket, antenna coax connector, phones socket, key socket, RCA plug and socket for VFO, power supply terminals, knobs, 12 V relay with two sets of c/o contacts, miniature SPST and DPDT switches (one each), miniature 50 ohm coax, chassis items including IRF511 mounting hardware, screws, nuts, washers, and VFO spacers.

*"Nar Meian" Gatters Road, Wonga Park, VIC 3115

ar

Voice Repeater Control Unit

*R S Graham VK4BRG * describes a comprehensive Repeater Interface Controller.*

This unit consists of a CW ident generator, associated nine minute timer and a timeout timer. It has been designed to fit into and interface to a Philips FM-828 transceiver, mentioned previously in another role in AR for April 1993, page 21.

These radios seem to be the most popular of all for amateur repeaters. However, the design could well be adapted to suit other types of radios. The electronic design that follows is quite standard..the prime purpose of the article is to present a suitable design, EPROM programming details and a suitable layout, all in the one article. Thus other repeater builders have something to duplicate with a minimum of time and effort.

At the time of writing this article, it would appear that the DOTC requirement regarding repeater identification may be relaxed. Never-the-less, some repeater builders, in consultation with users, may well decide that it would still be a good idea to have a CW ident on their repeater. Others may choose to use just the time out section, the ident. timer, modify the design etc. The keying section is also suitable for keying a beacon. In this application, it could be expanded by programming additional EPROM data line(s) to, for example, change the beacon power level, switch antennas etc. There is a lot of space left in the EPROM!

The unit is built on vero-board and consists of four sections:-

a) CW ident section.
b) Ident timer..nine minutes... (adjustable).
c) Time out timer .four minutes... (adjustable).
d) Interconnecting logic.

My suggestion is to build and test the various sections in that order.

The CW ident section uses U2 (555 timer) to generate the clock signal for U3. The 50k preset adjusts the clock frequency and thus the CW speed. When pin 11 (reset) of U3 (4040 ripple counter) is low, the U3 outputs sequentially scan the first seven address lines of U4, a 2716 EPROM.

Three EPROM data lines are used:-

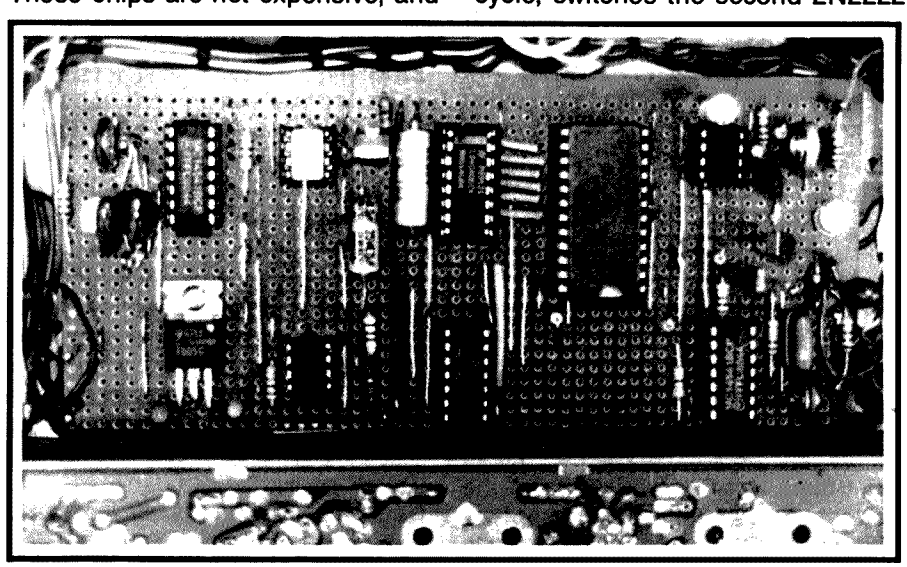
a) D0 (pin 9) for the actual CW keying.
b) D1 (pin 10) to hold the TX keying on for the duration of a keying cycle. This is necessary if a user just momentarily keys the repeater. The TX is then held on for a complete keying cycle.
c) D2 (pin 11) provides a reset pulse at the end of a keying cycle.

The keying signal (D0) enables U5 (a 555 in the astable mode) which generates the keyed audio. Its frequency is determined by the resistor/capacitor combination on pins 2, 6 and 7. This is, of course a square wave, but the 56k resistor/.022 μF capacitor combination in the output circuit modifies this to an approximate sine wave output. The 1K resistor prevents loading of the radio audio circuit when the output level preset pot is near minimum. D1 enables the transmit keying line via a 2N2222 transistor (T1). The reset pulse (D2) is used, via inverter (U8c), to reset the nine minute timer (U1).

Both the timers (U1 and U9), use a 4541 timer IC in similar circuits. These chips are not expensive, and have the advantage of providing long timing periods with small value capacitors. Matrix board pins are used at these capacitor locations so that smaller value capacitors (.0027 μF) may be initially installed. This procedure is recommended for initial testing, giving a timing period of around 50 seconds with the presets at mid-range. One is then not wasting so much time in waiting for the timers. Another time saver, that I used in similar situations, is to temporarily wire a LED and a series resistor (470 ohm) from pin 8 of each timer to ground. One can then visually see the timers states during the testing period. The .0027 μF capacitors are replaced with the correct values near the end of the testing period.

U7 (555 timer) is used to control the 4040 reset line. Pin 2 of U7 is normally high and senses the receiver mute line which goes low on receive. When this occurs, and provided the chip is not "held off" by pin 4 being held low (when U1 is timing), pin 3 of the 555 goes high, which, via the inverter U8(d) resets the 4040. Should the receive mute be open at the conclusion of a U1 timing cycle, as it would be during extended repeater operation, the 4040 is immediately reset, and thus a keying cycle is recommenced after each nine minutes of repeater operation.

The receive timeout timer (U9) is reset each time the receive mute opens. The output of that timer, (pin 8), which is high during the timing cycle, switches the second 2N2222



Voice Repeater Control Unit showing the Veroboard construction.

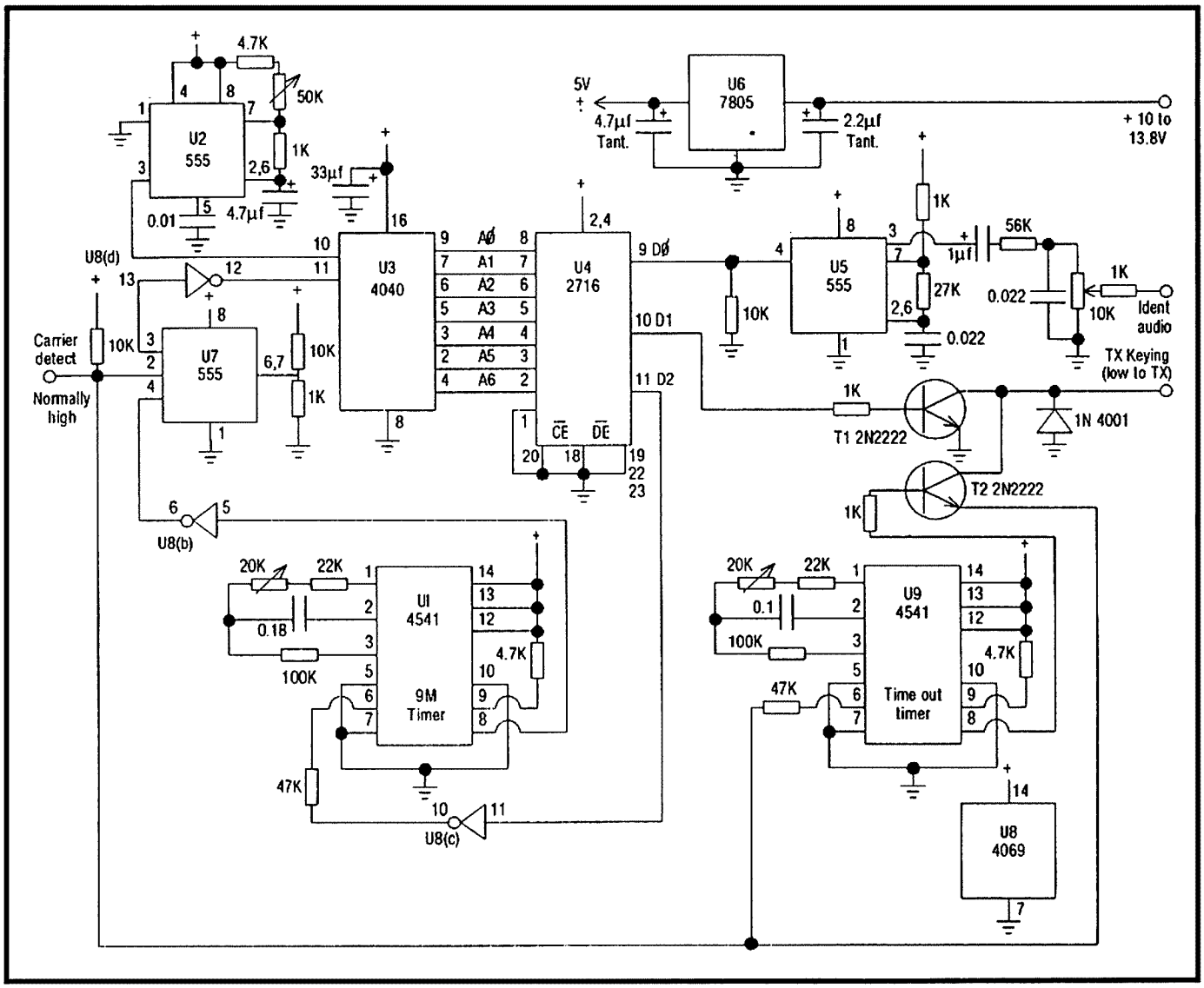


Figure 1 — Schematic Diagram of the VK4BRG Voice Repeater Control Unit.

transistor (T2) on and completes the TX on circuit from the receive mute line.

So it can be seen that the TX is on under the following conditions:-

a) In order to complete a keying cycle, via T1 (2N2222).
b) Should the receive mute be open AND the timeout timer period not be expired.

The unit is powered from the output of a 5 volt regulator. I used a 7805 one amp unit, but the 100 mA 78LO5 would be more suitable. With the FM-828 radio, I ran this control unit from the 10 volt rail. Of course, a 13.8 volt supply point would be equally suitable.

Acknowledgments to Will, VK4XP, who provided me with an initial electrical design, plus some necessary inspiration. Also to Dave, VK4UN, for burning the EPROM and to Stan, VK4BZO, for the photograph.

* PO Box 323, Sarina Qld 4737

ar

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

A 40 Watt Switched Mode Power Supply

K W Gooley VK5BGZ presents an informative and ingenious constructional article.*

WARNING FROM THE EDITOR

This project SHOULD NOT be attempted by persons unqualified to obtain the RELEVANT ELECTRICAL CERTIFICATION applicable in their State, which is issued by their local Electrical Authority.

Switch Mode Power Supplies operate on the MAINS ELECTRICITY SUPPLY. Do NOT work on these power supplies without external isolation.

A separate low voltage power supply should be used for testing circuitry around the control chip. A variable transformer on the mains inlet to the Switch Mode Supply is essential when testing. Always test at low voltages first.

Remember, the case of the Switch transistor (OR FET) will be at MAINS POTENTIAL, as will their heat sinks.

Operational Switch Mode Power Supplies should always be enclosed in a protective container.

Always use a safety shield when working on these power supplies and NEVER fiddle with mains electricity; it is lethal.

Switched Mode Power Supplies. UGH!! Is that your reaction to the subject? Complicated things, generating lots of radio, TV etc interference; to be kept at arm's length as much as possible? Well, that was my attitude a few years ago but it has been changed firstly by repairing a couple; one powered an Apple II computer as I recall. Then I decided that these types of power supplies were going to be used more and more in electronic equipment so I'd better come to grips with the technology. After reading a few articles on the subject and parts of a book or two I designed my first off-line SMPS and it's not that hard. Now several power supplies later, I designed the SMPS that is about to be described, a 13.8 volt 3 Amp unit used to power a 10 watt 2 metre FM transceiver. It's small and efficient, needing no large finned heat-sink. The aluminium case is sufficient, **AND** it generates no TV, radio or other interference.

Before we go on to describe the unit's design and construction, some general background on the subject of switched mode power supplies may assist readers.

There are many types of switching supplies, each having its own characteristics and intended purpose. The simplest to understand if not to build, is perhaps the switching regulator where a low output voltage is required from a much higher one. The input voltage may be generated with a conventional transformer, rectifier, filter-capacitor combination. This type of regulator has been used in various laboratory supplies requiring a wide range of output voltage with high efficiency (it is known as the "buck regulator"). A series switch transistor is turned on and off with a duty cycle dependent on the difference between input and output voltage. A filter choke and capacitor smooth the output. A commutation diode is used to maintain continuous current flow in the choke while the series switch is off (figure 2).

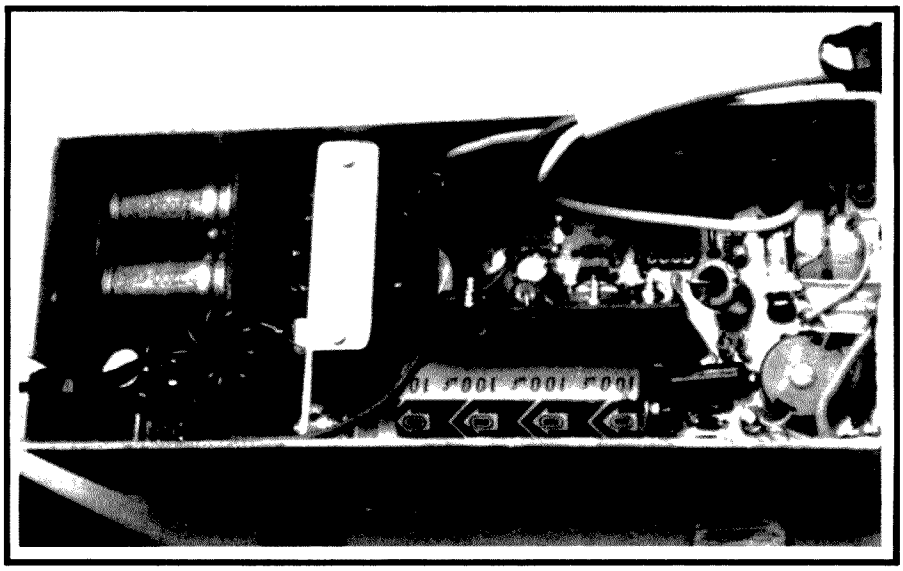
By rearranging the positions of the 4 basic components as shown in figure 3, voltages higher than the input can be obtained; the so-called boost regulator. If the output of the buck regulator is grounded and the commutation diode used to switch the energy stored in the choke into a storage capacitor, negative output voltages can be generated (figure 4).

If isolation between input and output is required a secondary winding can be coupled to the choke making a transformer. But it may or may not function as a conventional transformer. Lower powered SMPSs < 50 to 200 W are usually of the flyback type where energy is stored in the "primary" during the switch ON period and transferred to the secondary circuit during the OFF period. In this situation, the transformer doesn't operate as a conventional transformer in that current does not flow simultaneously in primary and secondary windings. It is sometimes referred to as a coupled choke to emphasise the difference in operation. The operation of flyback types of supplies may be discontinuous where current flow in the secondary ceases before the end of the OFF period, or continuous where secondary current flow continues to the end of the OFF period and not all the energy stored in the primary is transferred to the filter capacitor. The discontinuous type of flyback power supply is also known as a ringing choke converter and is widely used for small DC-DC converters.

If power outputs greater than about 100 to 200 Watts are required, it is generally preferable to use the forward configuration of supply because flyback transformers become excessively large. More power throughput for a given transformer size can be obtained from one of the forward mode configurations. In a forward supply, current flows in the primary and secondary simultaneously as in a true transformer rather than alternately as in the flyback coupled choke.

Design

Now to this particular power supply. The basic architecture of an off-line SMPS is shown in figure 5 . A bridge rectifier and filter capacitor produce 340 volts DC directly from the 240 volt AC mains. A MOSFET, when switched on, applies the DC to the coupled choke primary and current starts to rise in a linear ramp. The rate of rise is di/dt = V/Lp. Where Lp is the primary inductance and V the applied voltage, approximately 340 volts. With the particular control IC used, a UC3843, the end of this ON period may be brought about in one



Internal view of the 40 watt Switch Mode Power Supply.

of three ways. Firstly, the feedback loop from the output voltage will tell the controller that sufficient energy has been stored in the choke primary and the switch should turn off. This is the usual reason that the controller IC ends the ON cycle. However, if the power supply is overloaded and the MOSFET switch source current exceeds a certain value, in this case about 1.5 Amps, the control chip ends the ON period to protect the switch.

The third mechanism which can end the ON period is a limit that is placed on the duty cycle by the designer's selection of the resistor in the oscillator section of the controller. The IC data sheet includes a graph of timing resistor value against duty cycle. With the resistor selected in this design 10 k, the maximum duty cycle is 95%. An extra margin of safety could be incorporated by reducing this value to say 1 k where the maximum duty cycle would be reduced to about 50%. Of course to maintain the same oscillator frequency the timing capacitor C14 would have to be increased to 47n.

When the MOSFET switches off, the voltage across the primary reverses with the drain voltage rising to well above the 340 volt supply. At this point the secondary diode conducts and the energy stored in the primary is dumped into the filter capacitor replacing charge that flowed to the load during the OFF period.

The main task in designing a power supply such as this is the design of the power transformer or coupled choke. Firstly, the power throughput is calculated:

Output voltage = 13.8 volts
Output current = 3 amps
Expected overall efficiency = 75%
Therefore input power
P_{in} = 13.8 x 3 x 1/0.75 = 56 watts

The next step is to select an operating frequency, 40 kHz in this case. This is a reasonable compromise between lower frequencies where the transformer is larger, and higher ones where suitable components are less easily available. The available FETs, controller ICs and diodes will cope with much higher frequencies but ferrite core losses increase with the 1.2 power of frequency and ferrites suitable for power conversion at frequencies of 200 kHz to 1 MHz are not as readily available as those for lower frequencies. So 40 kHz it is. This means that the period of oscillation (T) is 25 μsecs.

Next we select the full load duty cycle (η) of the MOSFET switch. This selection is based on the facts that the smaller we make it, the bigger the choke core must be for the required power output while an upper limit is placed on duty cycle by the time required to transfer all the energy to the filter from the choke core during the OFF period. The maximum duty cycle was selected as 35% as a reasonable compromise, one that is used commonly in published designs.

With the duty cycle selected we can easily deduce the full load ON time of the switch.

$t_{on} = T \times \eta = 25 \times 0.35 = 8.75 \mu seconds$

Since the power throughput is 56 watts we know that each cycle the energy stored in the core is :-
$P_i \times T = 56 \times 25 \times 10^{-6} = 1.4$ mjoules.

This is the energy stored as current flow in the inductance of the choke primary at the end of the ON period and is defined by the equation:

$$W = 1/2\ L_p\ i^2_{max} = P_i \times T = 1.4\ mJ \quad \ldots\ldots\ (1)$$

Where L_p is the primary inductance and i_{max} is the MOSFET drain current just prior to turn-off.

We also know that the rate of rise of current in an inductor is given by the equation:-

$$\frac{di}{dt} = \frac{V_{DC}}{L_p} \quad where\ V_{DC} = 340\ volts$$

The current rises linearly from 0 to i_{max} during the ON period of 8.75 μsec. Therefore:-

$$\frac{di}{dt} = \frac{i_{max}}{t_{on}}$$

Equating these 2 expressions for di/dt, we get:-

$$i_{max} = \frac{V_{DC} \times t_{on}}{L_p} \quad \ldots\ldots\ldots(2)$$

Substituting for i_{max} in equation (1) we obtain an expression for L_p.

$$L_p = \frac{2 \times P_i \times T \times L_p^2}{V_{DC}^2 \times t_{on}^2}$$

Rearranging:-

$$L_p = \frac{V_{DC}^2 \times t_{on}^2}{2 \times P_i \times T}$$

Since we know all these parameters, we deduce that the required primary inductance is 2.64 mH. Substituting this value into equation (2) we find that i_{max} is 1.03 Amps.

The next task is to select the core type and size. The EC series of ferrite cores are convenient to use as they are composed of 2 E shaped sections which allows for good heat removal due to the open construction of the resulting transformer. In addition the centre leg is circular making winding the turns on the bobbin easier. Charts shown in data sheets on the ferrites

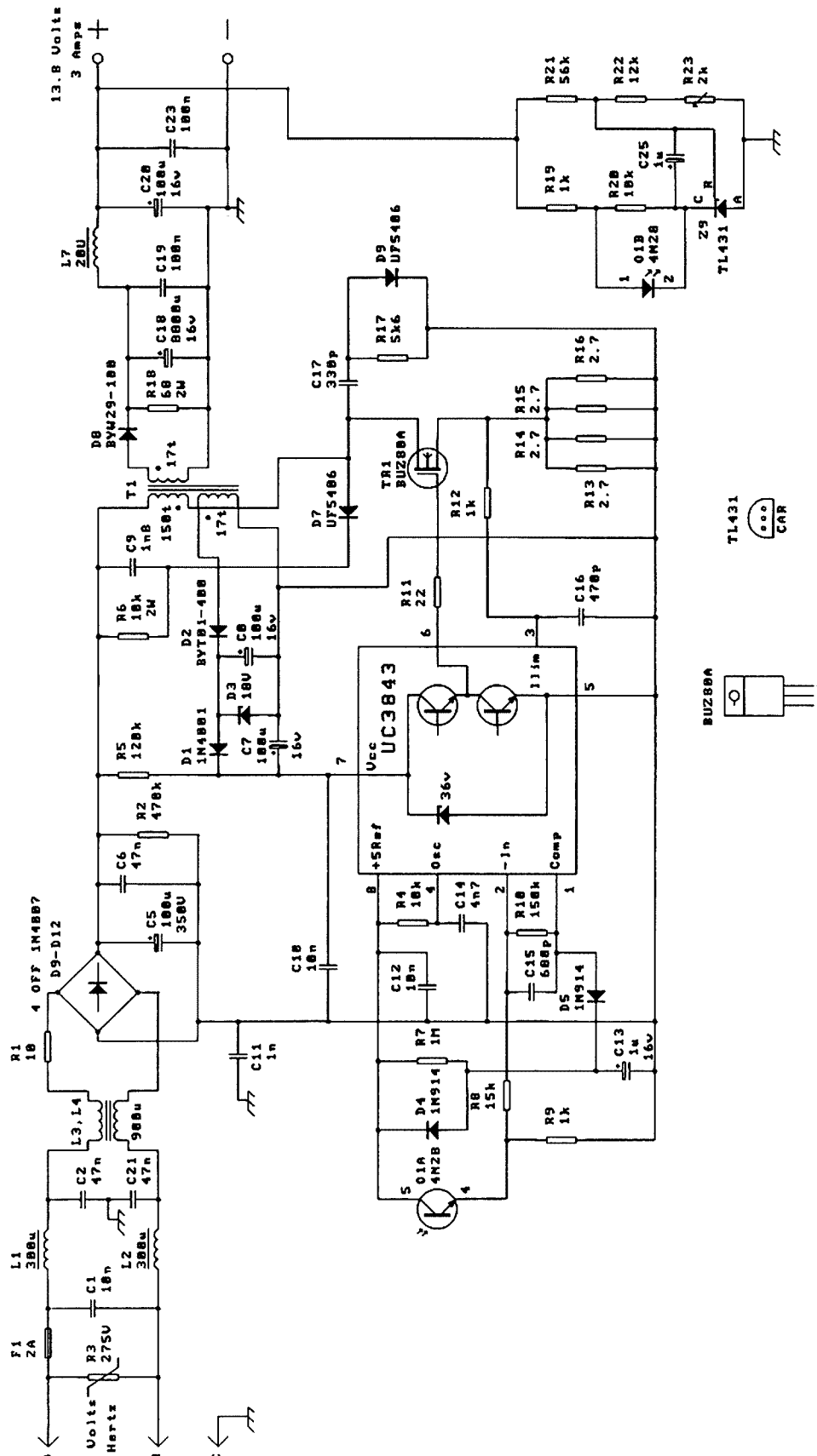


Figure 1 Circuit Diagram of the 40 Watt Switch Mode Power Supply.
Choke and other component details.
L1, L2 — 50 turns 0.4 mm wire on Amidon type T50-26 toroid.
L3, L4 — 33 turns epprox 0.4 mm wire on P18/11 potcore. Use a two section bobbin if possible to separate windings.
L7 — 13 turns 1.33 mm wire on three stacked toroids, Amidon type T68-26.
T1 — See text. EC41 ferrite core 1.9 mm airgap ground in the centre leg.
C18 — consists of four 2,200 μF oepacitors in parallel.

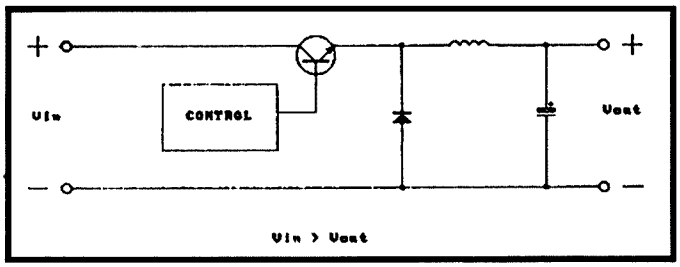


Figure 2 Buck Regulator.

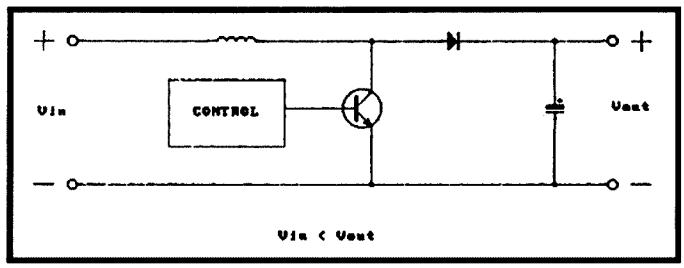


Figure 3 Boost Regulator.

give a guide to the size selection for a given power level and frequency. I chose a type EC41 as this size is more than adequate and I wanted a good margin of safety in terms of temperature rise and also plenty of room in the winding space for good insulation. If one were designing a transformer for large scale production a smaller core could be chosen for this power level and frequency and more care taken with winding and the selection and placement of insulation. As it is there is plenty of room for winding and insulation.

We must now work out an appropriate number of primary turns and the size of air-gap to prevent the core saturating at the maximum primary current. An excellent article in recent ARRL Amateur Radio Handbooks describes a 13 volt 22 Amp flyback SMPS. This article gives the following equation linking primary turns, (N_p), flux density, (B_{max}), inductance and core cross sectional area.

$$N_p = \frac{i_{max} \times L_p}{B_{max} \times A_e}$$

We know i_{max} (1.03 Amps), L_p (2.64 mH). B_{max} is selected as 150 milli-Teslas, well below the nominal saturation flux density given by ferrite manufacturers as 300 mT. Not all readers will be familiar with this MKS unit of flux density.

1 T = 1 Weber per m^2 = 104 gauss.

A_e is the effective core cross-sectional area (m^2) and is given in the core data sheet as 121 mm^2 (1.21×10^{-4} m^2).

Putting all these values into the equation, we get N_p = 150 turns; not too much trouble to wind by hand. The air gap must be chosen to give the calculated inductance with the calculated number of turns. The Magnetic Components Data Book from Neosid Australia Pty. Ltd. gives good information on this subject. The following formula for the length of the airgap is given:-

$$l_{gap} = K \times l_e \left(\frac{0.4\pi \ N_p^2}{L_p \sum \frac{l}{A}} - \frac{1}{\mu_i} \right)$$

l_e is the effective length of the magnetic path, given in the core data sheet as 89.3 mm. N_p and L_p we have already calculated (150 turns and 2.64mH). $\Sigma l/A$ is a physical parameter of the core related to its shape and is given in the data sheet as 0.735 mm^{-1}. The factor k is included to take account of the fringing effects around the edge of the gap and unfortunately it is dependent on the length of the gap which is of course the unknown in the equation. However, for a gap of 1 mm k = 1.4 and for 2 mm k = 1.5. Thus the gap can be calculated as 1.9 mm. Alternatively the gap could be found by experiment. The inductance of the completed winding is measured and the air-gap adjusted until the calculated value is obtained.

Having determined the number of primary turns, the number of secondary turns can be calculated. As this is a coupled choke and not a true transformer, the turns ratio does not conform to the conventional transformer equation:-

$$\frac{N_p}{N_s} = \frac{v_p}{v_s}$$

We must put in a "fiddle factor" k. We won't go into the theory too far in this article but restrict ourselves to the practical. k varies in published designs from about 0.25 to 0.5 and for this design I chose 0.375. Hence secondary turns:-

$$N_s = N_p \times \frac{V_s}{V_p} \times \frac{1}{k}$$

$$= 150 \times \frac{13.8}{340} \times \frac{1}{0.375}$$

$$= 17 \ turns$$

An extra secondary is put on the transformer to supply the small amount of power required for the control circuit. The number of turns is chosen to be the same as the main secondary giving a nominal 14 volts across the filter capacitor C8. It would be inefficient to use the 340 volts DC with a dropping resistor as several watts would have to be dissipated in the resistor. A high value resistor R5 provides the power to get the circuit started (pull itself up by its bootstraps) and once sufficient voltage is available from the rectifier D2 and filter capacitor C8, the bulk of the drive power comes from this source.

The selection of main switching device is made with the knowledge of the peak current, 1.03 Amps plus a safety margin and a voltage rating governed by the peak voltage across the device when in the OFF condition. Neglecting leakage inductance effects, the maximum drain voltage in the OFF state is:-

$$V_p = V_{DC} + \frac{N_p}{N_s} \times V_o$$

$$= 340 + \frac{150}{17} \times 14.8$$

$$= 470 \ volts$$

Leakage inductance effects cause a spike on the front edge of the drain voltage pulse so an adequate safety margin needs to be included. The chosen device is rated at 800 volts and 3 amps.

The main output rectifier carries a peak current of 3 x $1/\eta$ where η is the duty cycle = 0.35. This comes to 8.57 Amps peak. Consideration must be given to the peak inverse voltage rating of this diode because when TR1 is on, the voltage across the diode is:-

$$V_{drev} = V_{DC} \times \frac{N_s}{N_p} + V_o$$

$$= 340 \times \frac{17}{150} + 13.8$$

$$= 52 \ volts.$$

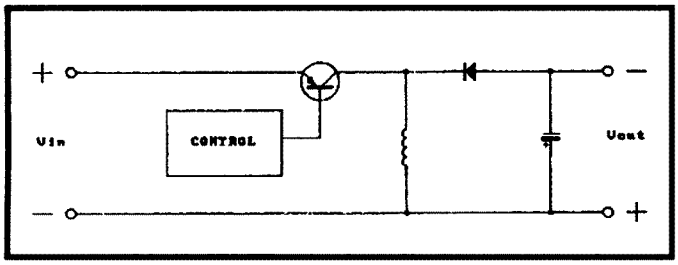


Figure 4 Voltage Inverting Regulator.

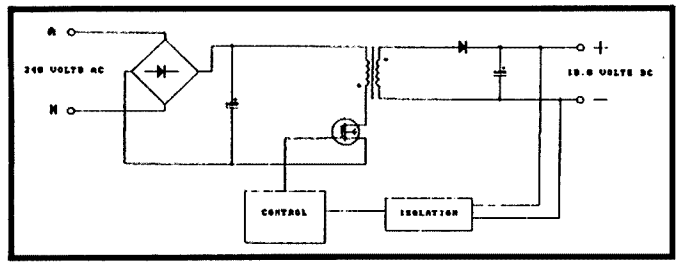


Figure 5 Off-Line Flyback SMPS.

The device selected has a 100 volt 8 Amps average rating.

The other component in this section worthy of consideration is the main filter capacitor C18. This is selected on the basis of ripple current rating. The full load current flows into and out of the capacitor each cycle and it must be capable of carrying this current without over-heating. 2.2 millifarad (mF) 16 volt electrolytics have a current rating of the order of 1 amp depending on the type and manufacturer. Four of these are used in parallel to give an overall RMS ripple current rating of 4 amps.

The Control Circuit

Control of the power supply operation is largely in the hands of the UC3843 IC. This neat little 8 pin device contains a 5 volt reference, an oscillator, an op amp, comparator and an output stage capable of peak currents of 1 amp. It is ideal for driving MOS power devices. The oscillator frequency and maximum duty cycle are determined by R4 and C14. The op amp and comparator modulate the oscillator duty cycle such that a fall in output voltage causes the MOSFET switch ON time to be lengthened, increasing the energy supplied to the load restoring the output voltage.

The feed back control works in the following way. Z9 is an adjustable voltage reference which attempts to maintain a voltage of 2.5 volts between its control terminal and anode by varying the current flow from cathode to anode. The voltage divider R21, R22, and R23 sets the voltage at the control terminal of Z9. With the values given, an adjustment of output voltage of about 0.5 volts is available.

If the output voltage falls, the cathode current of Z9 rises turning on the optocoupler LED further which causes the phototransistor to conduct more current. The consequent rise in voltage across R9 causes the op amp and comparator to lengthen the TR1 ON period, increasing the output voltage. Conversely a rise in output voltage causes the cathode current of Z9 to fall and the consequent falling voltage across R9 shortens the TR1 ON period reducing the output voltage.

The ratio of R8 to R10 determines the feedback loop gain and the loop stability is enhanced by C15 and C25. A "soft start" feature is provided which allows time for things to settle down after the mains power is applied before the MOSFET switch TR1 is first switched on. This is accomplished by R7, C13, D4 and D5. C13 serves to hold the voltage on pin 1 of the IC low for about 300 msecs preventing the output from switching on.

Current overload protection of TR1 is implemented by sampling the source current through the 4 paralleled resistors R13 to R16. If the voltage across these resistors exceeds 1 volt, the control IC switches the MOSFET off. R12 and C16 prevent short transients (< 0.5 μsec) triggering the current protection.

EMI

Electromagnetic interference (EMI) considerations are taken care of by a 2 section filter in the mains circuit. A pair of chokes L1 and L2 on separate iron powder toroids reduce interference appearing on the active with respect to the neutral and vice versa (differential mode) and a 2 winding choke L3 and L4 on a pot core reduces common mode interference appearing on both active and neutral with respect to earth. The 2 windings must of course be well insulated from each other and in the prototype a 2 section bobbin was used. The EMI suppression capacitors C1, C2 and C21 must be rated for 240 volt AC mains operation.

The DC output is filtered with a π section filter with both large value electrolytics and 100 nF ceramic capacitors to filter both high and low frequency interference components. The choke must carry the DC load current and again iron powder toroids are used. It will be observed in the photographs of the unit that the positive output lead of the power supply is wound around another toroid. This choke is not shown in the circuit diagram and was included as a precautionary afterthought not because the unit generated any EMI.

There are some components which have not yet been mentioned and which deserve to be. These are the diode R-C networks associated with the drain of the MOSFET switch. Energy stored in the transformer leakage inductance during the ON period of TR1 is not transferred to the secondary but must be absorbed on the primary side one way or another. Efficiency considerations demand that this energy be kept as low as possible as it is wasted. Leakage inductance is kept low by sandwiching the secondary winding between the 2 halves of the primary.

If the diode R-C networks are not included, the energy would result in a voltage spike on the drain of TR1 of sufficient amplitude to destroy the MOSFET. The energy is therefore shunted away via D7 to C9 and dissipated in R6 which must be rated at 2 watts or so in this design. C9 should be rated at 600 volts or more. A network similar to C17, R17 and D9 is included in many off-line flyback power supplies and I included it as extra protection for the MOSFET.

Construction

Detailed construction information will not be given here as I do not expect other constructors to duplicate my unit exactly. However, figure 6 is included to illustrate the layout used. The demonstrator power supply was assembled on single sided blank fibreglass laminate with the components placed on the foil side and wiring on the reverse. A strip of copper about 5 mm wide was removed from the board separating the mains side from the output circuitry. The transformer straddles the gap in the ground plane. The bulk of the foil on the mains side is connected to the negative common of the 340 volts DC, while the output side foil is connected to the negative side of the 13.8 volts output which is also connected to the metal case and mains earth. There are 2 small isolated areas of foil in the corners of the mains end of the board through which mounting screw holes are drilled. Capacitor C11 connects between the mains end ground plane and one of these mounting screws.

Winding the transformer should be done with great care and attention to the polarisation of the windings. If all the windings are wound in the same direction, the dots on the circuit diagram indicate the start of each winding. The primary winding is wound with 0.5 mm wire and is wound in 2 sections of 75 turns each with the 2 secondary windings sandwiched between the 2 halves of the primary. The main secondary is composed of 7 strands (twisted) of the same wire as that used for the primary making a 7 × 0.5 mm Litz wire. 17 turns nicely occupy one layer on the EC41 bobbin. When designing such transformers it is necessary to give thought to how the turns will fit on the bobbin when making final decisions about the actual number of turns and the size of wire to be used. The 75 turns of each half of the primary completely occupy a full 2 layers.

Generous insulation should be placed between primary and secondary windings. I used "Empire Cloth" a woven material of ancient vintage. PVC tape could be used provided the transformer interior temperature does not exceed 70°C which is very doubtful at full load with this design. High temperature tape is available from some electronics suppliers. PTFE thread-sealing tape could be used as well.

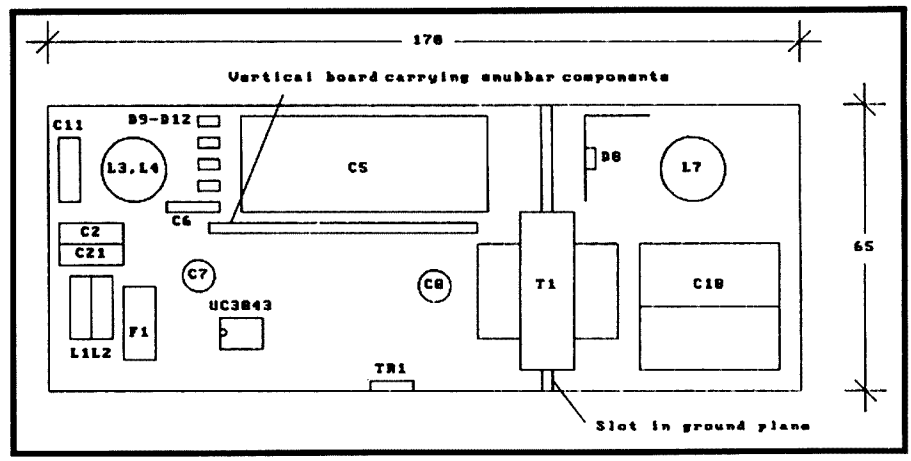


Figure 6 Layout Showing Major Components.

The air-gap, whether calculated or derived by experiment can be inserted in the magnetic path by placing pieces of insulating material of suitable thickness between the halves of the core. Alternatively, the centre leg of one of the core halves can be carefully ground on a bench grinder until the correct gap is obtained. Using this method invariably results in some chipping of the ferrite around the edge but as long as the chips are not too big, no harm will result. The important point is that the primary inductance is somewhere near the calculated value.

Heatsinking requirements for this supply are not great due to the high efficiency. The MOSFET is mounted on the inside of the case which is fabricated from 2.5 mm aluminium sheet. The drain of the MOSFET is connected to the mounting tab and care should be taken that sufficient insulation is placed between it and the case to withstand the 600 volts or so. I used a single silicone rubber heatsink pad. A 50 x 25 mm piece of 2.5 mm aluminium suffices for a heatsink for the output rectifier diode.

The snubber components associated with the drain of the MOSFET were mounted on a separate piece of fibreglass board mounted vertically on the main board. This was done to conserve space as these components are larger than the majority of minor components in the power supply.

Conclusion

Well there it is, a flyback off-line SMPS of modest output contained in a case of compact dimensions. As indicated earlier, it is not intended that the design be constructed on a wide scale but rather the information given be used to engender a wider appreciation of SMPSs and also that the more experienced amateur constructor be able to design and build similar power supplies to his/her own requirements.

Torr-Crest Tenafeate Court, One Tree Hill SA 5114

ar

Coaxial Cable Traps — In Search Of The Perfect Antenna

Paul Duff VK2GUT describes how to build superior coaxial traps.*

Ever hear the one about the amateur who pulled down all his antennas and never got around to putting them up again? About two years ago I got fed up with trying to get out on 80 metres with a dipole 20 feet off the ground and no decent earth. A change of QTH seemed the perfect chance to look at my options, especially as the new site, a small semi in the suburbs, had very little ground space. What I really wanted was an antenna which was easily built, easily mounted and demounted, easily matched, had broad multiband function and an omnidirectional pattern of radiation. It also had to be portable.

See why I never got back on the air?

Last year, however, I got my full call and, fired with enthusiasm, I tackled the problem afresh. A multi trapped vertical, chimney mounted and fed with open wire line via a transmatch, such as the Z Match, seemed to fill most of my criteria except for the broadband response and ease of construction. Every design that I came across seemed to be a mass of high voltage capacitors, difficult to tune coils and hard to shape phenolic spacers. That was when I came across the idea of using coaxial cable in traps.

Theory

The most basic coaxial cable trap uses the coaxial cable as a capacitor, see Fig 1. This is simple but cumbersome and offers no great advantage over a standard trap.

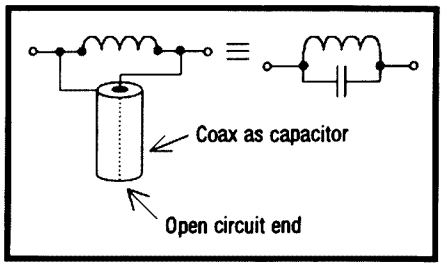


Fig 1 Basic coax trap.

The idea of using the coaxial cable as both coil and capacitor first appeared in QST in May 1981, see Fig 2. The shield acts as the coil. The inner conductor, because each turn is shielded from the next, has no more inductance than a straight wire of the same length but the coaxial cable still maintains its inherent capacitance. The result is a much more elegant trap but electrically it has little more to offer than the simple trap. The electrical equivalent is shown in Fig 2.

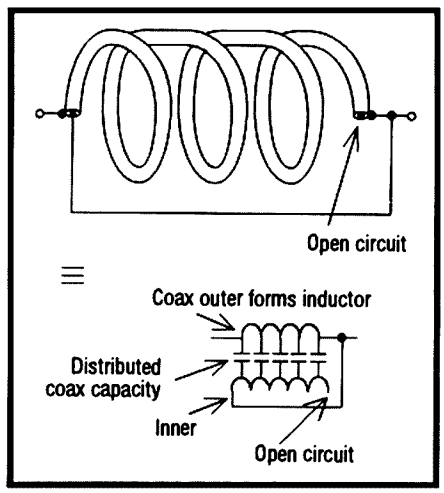


Fig 2 Coax also forms coil.

In Ham Radio for October 1981, Gary O'Neill N3GO described a coax trap, Fig 3, which looked the same but, in fact, was very different. This I have tried to represent in the circuit diagram. In this trap the shield and the inner conductor are magnetically linked and the current thus induced means that this circuit has much more inductance than that in Fig 2. This current, however, changes the whole phase arrangement of the capacitive element which also consists of the shield and the inner conductor. The result is that the capacitance decreases in direct proportion to the increase in inductance. If the coupling is perfect, which it nearly is, the inductance is increased by four and the capacitance is decreased by four but the resonant frequency stays the same (Ref QST August 1985).

To follow why these traps are superior you may refer to the equations in Table 1.

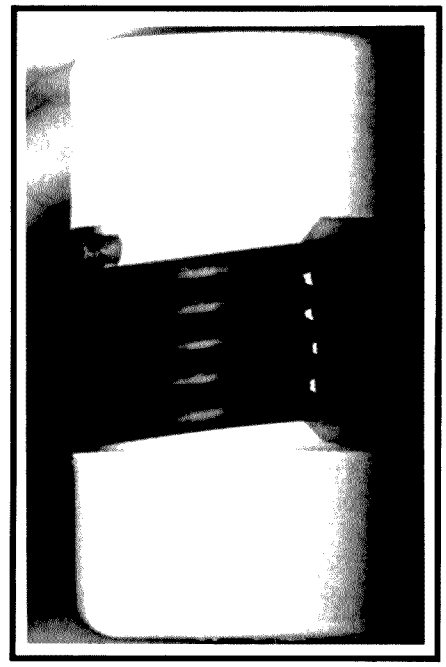


Photo 1 Side view of 14.2 MHz trap.

$$Z = \frac{\sqrt{J(Xo)}}{(F/Fo) - (Fo/F)} \quad \text{EQN 1}$$

$$Xo = 2\pi FoL \quad \text{EQN 2}$$

$$L = \frac{(D+t)^2 n^2}{18(D+t)+40nt} \quad \text{EQN 3}$$

$$C = \frac{Co\pi n(D+t)}{12} \quad \text{EQN 4}$$

$$Fo = \frac{1000}{2\pi\sqrt{LC}} \text{ MHz} \quad \text{EQN 5}$$

All lengths in inches (with apologies) as sourced from US articles and books.

Xo = reactance at resonance of either the inductor or capacitor
L = inductance
C = capacitance (total)
Co = capacitance fo coaxial cable per foot
F = operating frequency
Fo = resonant frequency
Z = tuned circuit impedence
n = number of turns (assume close wound)
t = thickness of the coax with insulation on
D = inner diameter of the coil

Table 1 Parameter equations.

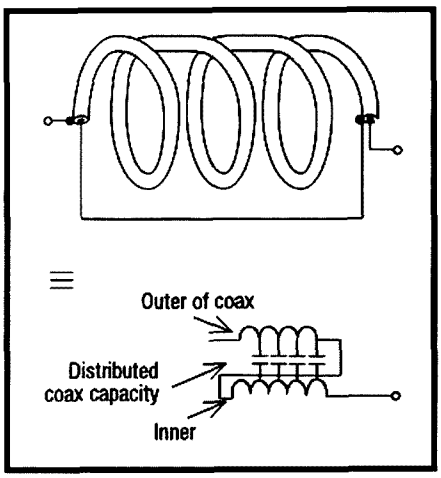


Fig 3 Inner plus outer in series.

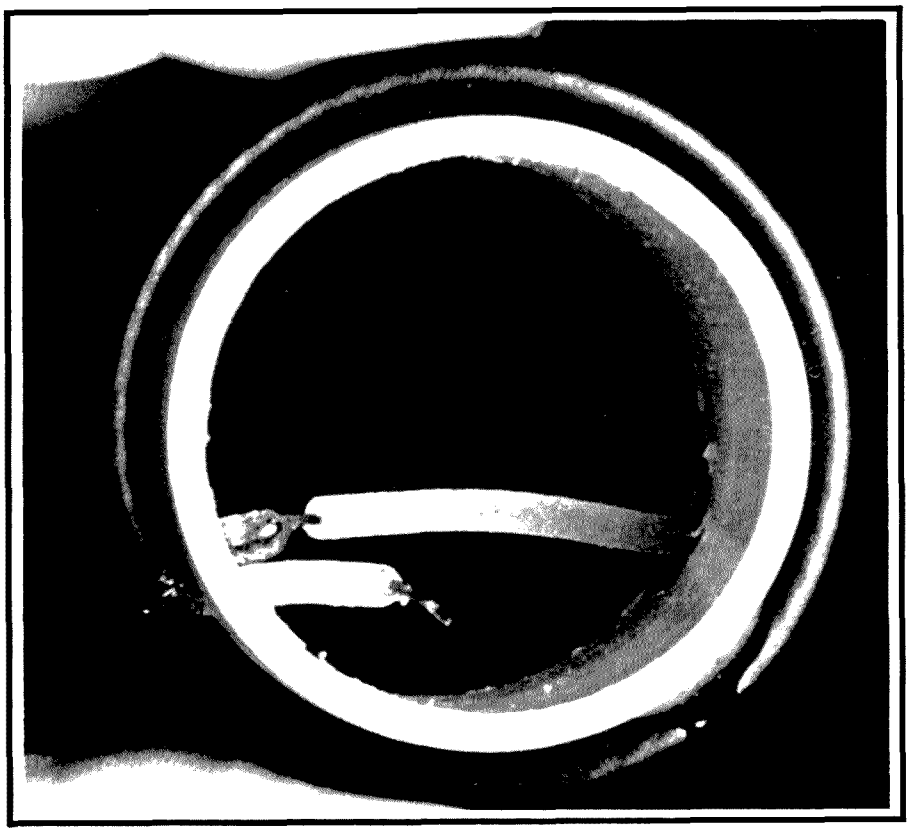


Photo 2 End view of 14.2 MHz trap.

The perfect trap would give 100% isolation across the band of interest and 100% conduction outside that band. An adequate trap, being one which will give an SWR less than 2:1 across the band, must provide at least 7 kΩ of isolation at the band edges. This band edge impedance is directly proportional to the reactance at resonance of either the coil or the capacitor. See Eqn 1 in Table 1. This is in turn directly related to the inductance. See Eqn 2 in Table 1. But below 30 MHz the losses from a trap are all from the coil. If these losses are represented as a resistor in parallel with the trap then a lossless trap will have infinite resistance and a lossy trap will have a low resistance.

Now look at the graph in Fig 4. Quite obviously the best trap is the one with the largest R and the largest L. Also notice that the trap impedance at resonance is equal to the value of R. I have already shown that the N3GO trap has a big inductance for its design. What O'Neil has also shown experimentally is that his trap has a high value of impedance at resonance in spite of this large inductance. What we have then is a trap with good bandwidth which is relatively loss free, is cheap and easy to construct and is power rated into the kilowatt range.

Design

Again refer to Table 1. If you can synthesise equations 3, 4, and 5 to give a value for n for a given value of L, Co, D, Fo, and t then you are better at mathematics than I am. For those of you like me, a simpler answer is to program your computer to substitute for values of n using a for/next loop until a given value of f is reached. In writing such a program two points should be noted. The first is that D+t is used as the coil diameter rather than D+2t so as to give the mean coil diameter and this works well. The second is that a value of D should be chosen to provide the shortest length of coax possible in the coil as this will reduce losses to their minimum. This occurs when the denominators in equation 3 are equal. That is, when (D+t)/nt = 2.22. In reality any value between 2.5 and 1.0 provides an acceptable coax length (Ref QST Dec 1984). A Basic program for the C64 is given in Table 2. This should be adaptable to other computers. A set of optimised trap dimensions is given in Table 3.

Construction

Construction is easy if you just follow the steps below.

1. Choose a former of suitable diameter white PVC pipe and cut a short length.

Table 2

C64 BASIC Program to Calculate Trap Dimensions

```
10  PRINT "FORMER DIAMETER" :ENTER D
20  PRINT "COAX THICKNESS IN INCHES" :ENTER T
30  PRINT "COAX CAPACITANCE IN pF PER FOOT" :ENTER Co
40   PRINT "DESIRED FREQUENCY IN MHz" :ENTER \X
100 FOR N = 1-500step0.25
200 L = ((D = T)EXP2*nEXP2)/(18*(D*T) = (40*n*t)
300 C = Co*3.142*n*(D = t)/12
400 f = 1000/2*3.142*(sqr(D = t))
500 IF f< = X THEN GO TO 700
600 NEXT n
700 PRINT "NUMBER OF TURNS EQUALS " :N
800 PRINT "COAX LENGTH EQUALS " :N*(D + t)/2.54:"mm"
900 END
```

Table 3
Dimensions of optimised traps using RG58C/U coax and commonly available PVC formers.

Frequency (MHz)	Former ID	Former OD	Turns Tight Wound (n)
3.6	70 mm	75 mm	10.2
7.1	60	64	6.8
14.2	40	44	5.5
21.5	32	36	4.75
28.8	32	36	3.75

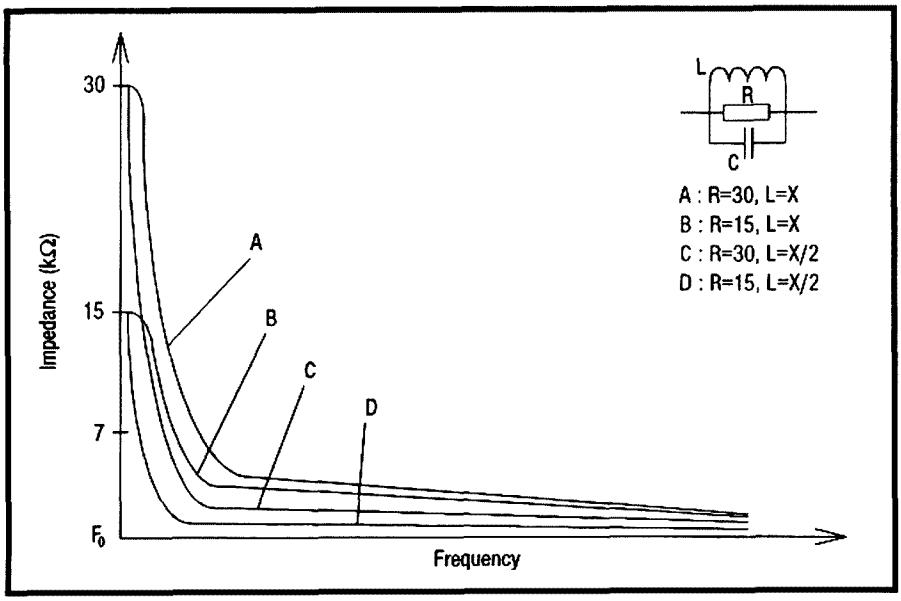


Fig 4 Relative impedance bandwidths.

2. Drill a hole for the coax near one end of the former.
3. Cut a piece of coax 6 cm longer than the calculated length needed for the coil. Strip 3 cm of cover from each end.
4. Insert one end of the stripped coax into the drilled hole on the former. Tightly coil the insulated length of coax around the former.
5. Mark the point on the former where the coax insulation finishes. Do not worry too much if this does not exactly correlate with your calculated value of n.
6. Remove the coax and drill a second hole at the marked spot.
7. Separate the exposed braid and conductor back to the insulation. Strip and trim the inner conductor as necessary and then rewind the coax trap. Finally solder the braid at one end to the conductor at the other.

The result should dip very closely to the required frequency but if any fine tuning is required this can be done by slightly separating the turns of the coil before applying glue to fix them in place. The photographs show a trap for 14.2 MHz.

Conclusion

The potential uses of such a simple device are endless. My own plans are to build a top loaded vertical for 80 through 10 metres for under $60. Multiband dipoles not requiring an ATU, dual or triband beams or simple dual or triband mobile use would be easy to build. Experiments with miniature coax may extend their use to VHF at least at low power. I can see these traps being the basis of antenna projects for years to come.

218 Ocean Beach Rd Woy Woy NSW 2256

ar

Remember to leave a three second break between overs when using a repeater.

WIA News

Canadian Convention

The first national convention of the Radio Amateurs of Canada (RAC) has been scheduled for 29-31 July 1994, to be held in Calgary, Alberta.

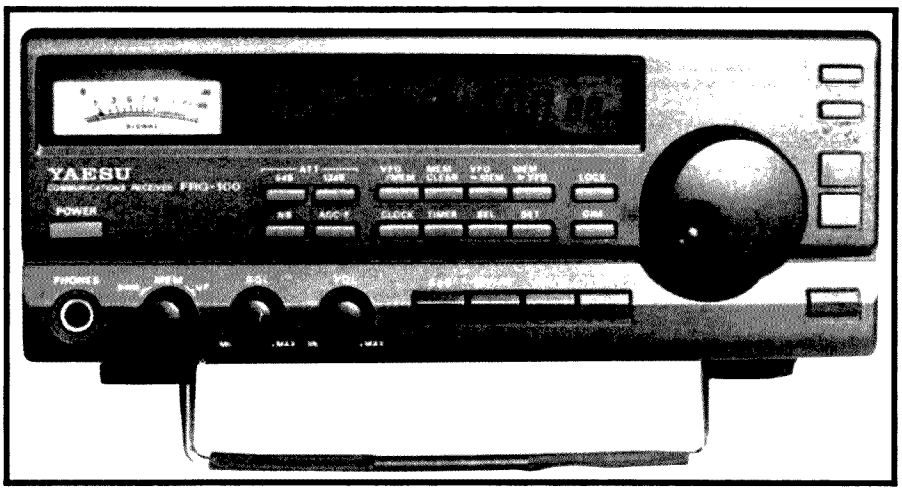
A feature of the convention is to be a technical symposium, and the RAC has issued a call for papers. Topics being considered include HF, VHF, UHF, plus operating modes such as RTTY, AMTOR and packet, along with space activities like AMSAT and moonbounce.

If you're interested in giving a paper, submit a proposal by 15 October; first draft of papers will be due by 1 March 1994.

Information from G W Shand VE6BLI, 55-51551 Range Road 212A, Sherwood Park AB T8B 1B2. (From the ARRL Newsletter).

EQUIPMENT REVIEW
Yaesu FRG-100 HF Communications Receiver

Ron Fisher VK3OM investigates the latest receiver from Yaesu.*



It seems that most amateur equipment manufacturers base their communications receiver design on an existing transceiver. Yaesu have always been different in this respect and have produced receivers that fit into a particular market niche. To go back to the beginning, the original FRG-7 was a runaway favourite in the low cost field. Rumour has it that the idea behind the FRG-7 was suggested to Yaesu by an Australian distributor when the South African Barlow failed to produce an updated version of the XCR-30, the receiver that set new standards in low cost performance in the early 1970s. While the XCR-30 worked well, it didn't look like a communications receiver. The FRG-7 looked right and worked well, particularly on SSB. The FRG-7000 followed with the added feature of a digital readout plus better selectivity for SSB. The FRG-7700 followed with updated design. The thirty bands 1 MHz wide were switch selected and no front end tuning was required. Yaesu also offered several popular accessories including a VHF converter and an antenna tuning unit. The FRG-7700 is an excellent choice on the secondhand market.

The FRG-8800 brought Yaesu receivers into the fully synthesised age. Now with continuous tuning right through the HF spectrum and of course a generous supply of memories. I am not sure if Yaesu intend to continue production of the FRG-8800 or whether the new FRG-100 will take over.

If I had been asked a few months ago to give an opinion on what a new Yaesu receiver would look like, I would have predicted that it would resemble the FT-890 amateur transceiver, but not so. The FRG-100 is a brand new design aimed at the lower price end of the professional style receiver range.

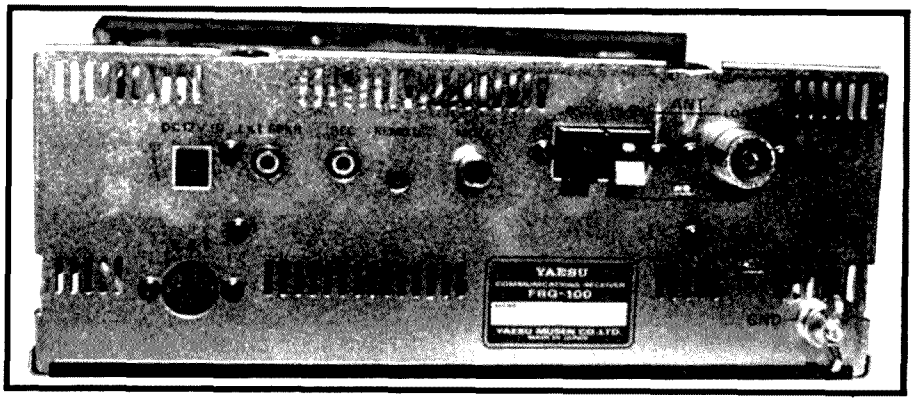
So, what is the FRG-100? What does it do and how well does it do it? The FRG-100 has full coverage from 50 kHz to 30 MHz. It receives AM, USB, LSB, CW and, as an option, FM. Three filters are included as standard, a 2.7 kHz for SSB, and 4 and 7 kHz for AM. CW reception uses the SSB filter but Yaesu offer a 500 Hz filter for improved reception as an optional extra. A large and clear LCD displays the frequency readout, memory channel selection and most of the status indicators. The most surprising feature of the FRG-100 is that it does not incorporate a power supply. The receiver requires 12 to 14 volts at about 1.5 amps. There is also no provision for battery operation and, with the 1.5 amp drain, you would need a bit more than a stack of torch batteries to keep it going for any length of time. A rather flimsy DC cord is supplied with the receiver. Yaesu do produce a wall type power supply to suit but with Dick Smith's current practice of not importing power supplies it seems unlikely we will see this here. The next surprise is the size. I had seen photos of the receiver before seeing the real thing but that didn't prepare me for the diminutive size of the FRG-100. The overall size is 238 mm wide, 93 mm high and 243 mm deep. Weight is 3 kg. A carry handle is provided on the right hand side of the cabinet.

Controls on the receiver have been simplified with rotary controls provided for tuning, volume, squelch and memory selection. All functions are selected via twenty four push buttons and these include power on/off, front end attenuator, noise blanker, AGC fast/slow selection, four mode selection buttons, memory selection, VFO memory change over, clock setting and frequency band up/down selection.

In addition to this, many functions are selectable or can be changed to suit the operator by holding down certain buttons while turning on the power switch. The main tuning control is about 40 mm in diameter and while it is weighted, it lacks a good fly wheel effect. It does have a convenient finger hole which is a big help in spinning up and down the bands.

The FRG-100 On The Air

Overall, the receiver was a delight to use. The tuning rate on SSB and CW is 5 kHz per knob revolution and 50 kHz per revolution with AM reception. Both of these can be speeded up by ten times by pushing the "Fast" button. Band changing is via the Up/Down buttons to the right of the tuning control. This is normally in 100 kHz segments but again by selecting the "Fast" function this steps up to one MHz segments. The receiver is programmed to switch rapidly between the various short wave broadcast bands via the Up/Down buttons. This is enabled by holding the "Set" button then the



Rear panel view of the Yaesu FRG-100.

"Up" button. Now with "Fast" selected the Up/Down buttons will step in sequence the 15 broadcast bands. This includes the standard broadcast band and the European long wave band. Unfortunately, no similar system is provided to step between the various amateur bands.

The FRG-100 uses direct digital synthesis which gives very clean tuning. If you have been used to an older synthesised receiver, this will be very apparent when tuning AM signals. There is a distinct lack of clicks and plops and the tuning sounds as smooth and clean as your 1950s valve receiver!

AM performance was especially good with the choice of wide and narrow selectivity. Both of these have been well optimised. Many receivers switch to the SSB filter in the narrow position which is too narrow. AM audio quality was quite good but, as our tests show, the distortion is too high at high percentage modulation. While this will not worry many owners, a reduction of distortion down to one or two percent could make a substantial difference to AM reception. SSB reception was excellent. The product detector has low distortion and the slightly wider than normal bandwidth gives better than average audio quality. The inbuilt speaker gives acceptable audio quality, but connecting my normal station speaker made a very marked difference.

Two antenna input connectors are provided on the rear panel. An SO-239 for 50 ohm input and a pair of terminals for high (450 ohm) impedance input. A switch located on the rear panel between the two connectors allows switching between them. This allows two antennas to be connected to the receiver at the same time, say a dipole for short wave reception and a long wire for broadcast and general reception. Unfortunately, the switch is a miniature type which is sub mounted below the surface of the rear panel. It is necessary to use a ball point pen or a miniature screw driver to operate it and you have to be able to see it to do this. Why not a standard size slide switch mounted just below the top of the rear panel or, better still, a button on the front panel?

While on the antenna input side of things, a six and twelve dB attenuator is switchable from the front panel. When both are pushed together, they add to give 18 dB attenuation. The front end of the FRG-100 has excellent strong signal handling capability so the attenuator won't be needed very often. Yaesu haven't provided an RF gain control. Over the last few months I have bemoaned the lack of an RF gain in some of the new transceivers, but in the case of a general coverage receiver in this class I feel the lack of an RF gain is justified.

Two connections interface with a tape recorder. The "Rec" output is a constant level of 40 mV peak and uses a standard 3.5 mm socket. A second socket supplies remote switching for the tape recorder. This uses a 2.5 mm socket. Both are located on the rear panel. The remote switching operates with the squelch control. When a signal opens the squelch, the switch operates and turns the recorder on.

Two clocks can be set for two time zones in either 12 or 24 hour modes. As long as the external power supply is left connected, the clocks are displayed even when the receiver is switched off, although there is no display illumination until the receiver is turned on again. The display and "S" meter illumination can be dimmed from the normal level. On our review receiver, the illumination of the main display and the "S" meter appeared rather different with the meter having a higher level of brightness compared to the LCD.

The memory facilities are very comprehensive. There are fifty standard memories plus two others to set scanning limits. Scanning can be set to cover all memory channels or in groups of ten. It is also possible to lock out any memories not required during scanning operations. A priority channel facility allows any memory to be checked every five seconds while the receiver is operating on another frequency.

The FRG-100 is computer compatible and several pages of the manual are devoted to this.

The FRG-100 on Test

I put the receiver through our usual series of technical tests. These were carried out with the receiver powered from a 13.8 volt regulated power supply. The sensitivity was checked first.

Sensitivity Frequency	Sensitivity SSB for 10 dB SINAD	Sensitivity AM 10 dB SINAD	"S" 9
50 kHz	6 μV	30 μV	300 μV
150 kHz	1 μV	3 μV	70 μV
500 kHz	1 μV	3 μV	70 μV
1.0 MHz	1 μV	3 μV	50 μV
1.8 MHz	0.2 μV	0.5 μV	19 μV
3.6 MHz	0.2 μV	0.5 μV	19 μV
7.0 MHz	0.18 μV	0.4 μV	19 μV
10 MHz	0.18 μV	0.4 μV	20 μV
14 MHz	0.18 μV	0.4 μV	30 μV
18 MHz	0.2 μV	0.55 μV	32 μV
21 MHz	0.22 μV	0.6 μV	40 μV
24 MHz	0.26 μV	0.65 μV	42 μV
28 MHz	0.3 μV	0.7 μV	58 μV

The next test was for "S" meter linearity. This was checked at 14.2 MHz in USB mode.

'S" Meter Reading	Signal Input.
S1	1.4 μV
S2	1.6 μV
S3	1.8 μV
S4	2.2 μV
S5	2.8 μV
S6	4.5 μV
S7	7 μV
S8	14 μV
S9	30 μV
+20 dB	250 μV
+40 dB	240 mV
+60 dB	1800 mV

The AGC threshold was about 2 μV with the audio output increasing less than 0.5 dB above this level. Maximum audio output could be obtained with an RF input of 1.2 μV.

Selectivity was checked for the three installed filters.

SSB	AM/narrow	AM/wide
-6 dB 2.6 kHz	6.8 kHz	8.5 kHz
-40 dB 3.6 kHz	10.5 kHz	12.5 kHz

With the equipment I used to produce these figures, synthesiser noise limited me to the -40 dB measurements.

The audio output impedance is specified as 4 to 8 ohms with 1.5 watts into 4 ohms at 10% distortion. Our measurements produced 1.5 watts at 10% distortion with an 8 ohm load and 2.1 watts at 10% distortion with a 4 ohm load.

Distortion on SSB and CW at 0.5 watts output was 1% and on AM with 30% modulation distortion with 1 kHz modulation was 1.5% and with 90% modulation it had increased to 4.8%.

Frequency response was checked in the AM narrow and wide modes.

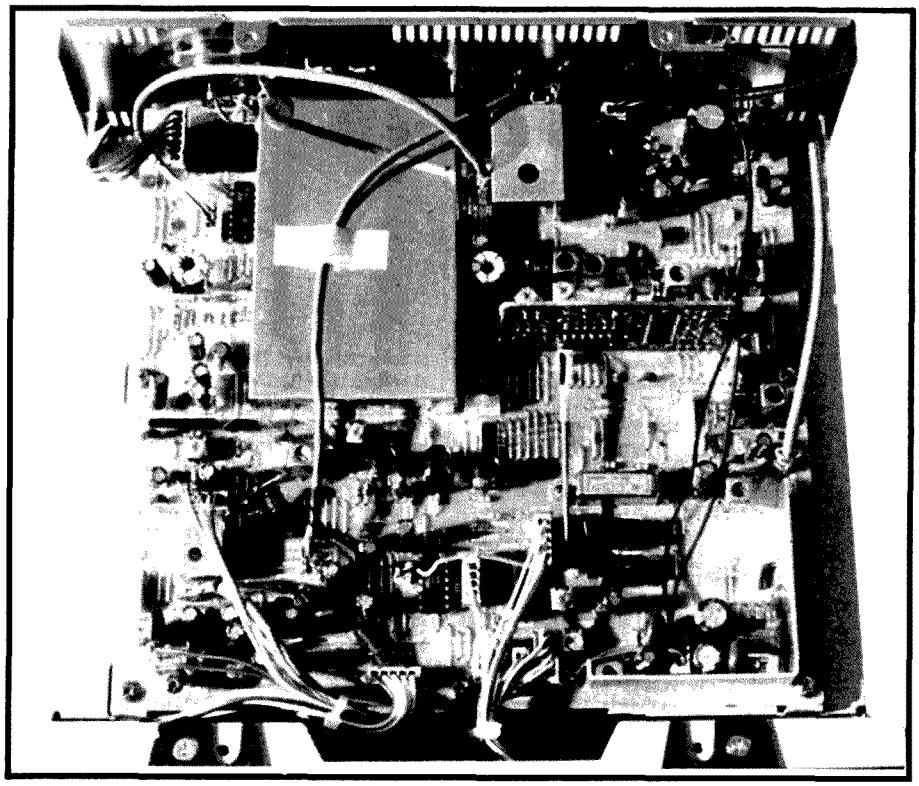
	50 Hz	75 Hz	100 Hz	250 Hz	500 Hz	1 kHz	1.5 kHz	2.5 kHz	3 kHz
Wide	-9 dB	-3.5 dB	-2 dB	+1 dB	+2 dB	0 dB	-1 dB	-5 dB	-8 dB
Narrow	-9 dB	-3.5 dB	-2 dB	+1 dB	+2 dB	0 dB	-2.5 dB	-15 dB	-20 dB

Receiver stability was checked over a long period of time and was found to be within 50 Hz of nominal at worst. Calibration of the readout was also within the above limits. This is excellent but can be improved by a factor of ten by fitting the optional high stability master oscillator, the TCXO-4.

Image and IF rejection were both excellent, all being better than -70 dB which is about the limit of my measuring equipment. Current drain at 13.8 volts was measured at 0.85 amps with no audio output and 1.2 amps at full audio output. A power supply of at least 1.5 amps output continuous would be needed to operate the *receiver*. The clock accuracy was checked over a three week period and was found to have gained two and a half minutes, not a very good result.

Over all, these figures are very good for a receiver in this price class. The SSB selectivity is a bit on the wide side and reflects on the low priced ceramic filters used in the 455 kHz IF. Much could be said for the AM selectivity; however, for general listening they are both quite adequate. Received audio quality is excellent in the SSB mode and good for AM. A better detector for AM with reduced distortion could make a worthwhile improvement. The internal speaker produced fairly good quality but a good external unit makes a startling improvement. Tuning ergonomics are excellent and the memory facilities should please everyone.

As delivered the receiver tunes down to 100 kHz not to 50 kHz as specified. Coverage down to 50 kHz can be enabled by pressing SSB and FM and then turning the power on. I



The FRG-100 with the top cover removed.

could find no mention of this facility in the instruction book.

The FRG-100 Instruction Manual

Yaesu instruction manuals are certainly setting the standards these days. The presentation is first class and all operating parameters are fully covered. Of the thirty nine pages, fully five are devoted to computer control. Unfortunately, Yaesu do not offer a computer control program as an option. They state that, "owing to the variety of incompatible computers used by our customers", they cannot offer programs. I believe that Dick Smith staff have produced programs for some of the later Yaesu transceivers; maybe they will work up something for the FRG-100. While no technical data is included in the manual, apart from the specification, a full circuit diagram is included.

Conclusions

By the time you read this, supplies of the FRG-100 should be available from Dick Smith outlets. If they can maintain the price at $999 with our rather sick dollar then this will represent excellent value. However, keep in mind, you will need a suitable power supply. The most suitable in the Dick Smith catalogue is the M9545 which is rated at 1.5 amps output and costs $84.95.

The FRG-100 has an excellent combination of facilities. It has excellent sensitivity, adequate selectivity and very high stability. It's all put together in an attractive package. Sure you can spend more and get better performance in perhaps one area or another but not much relative to what you will have to spend.

Our review receiver was loaned by Dick Smith Electronics and all enquiries should be directed to their store nearest to you.

"Gaalanungah" 24 Sugarloaf Road Beaconsfield Upper VIC 3808

ar

Support the WIA in order to protect Amateur Radio frequencies.

RANDOM RADIATORS

With Ron Fisher VK3OM and Ron Cook VK3AFW

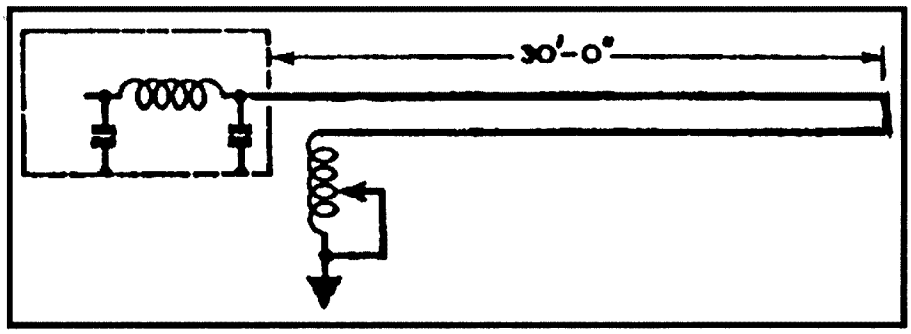


Fig. 1 The ZL1AYN "mini antenna" for 3.5 MHz.

Mini-flat-top for Eighty

Back in the good old days we had more freedom to put up full size antennas, largely due to a more tolerant and indeed interested attitude of neighbours. Today we would all like to have a small retracting vertical antenna that could be easily mounted outside on the shack wall. Of course, it would be capable of switching between low angle and high angle radiation and have a conservative 8 dBd gain on 14 to 30 MHz, 6 dBd on 10 MHz, 4 dBd on 7 MHz, 0 dBd on 3.5 MHz and, being a compromise, -3 dBd on 1.8 MHz. Some of the advertisers in overseas magazines seem to claim almost those specifications but present knowledge suggests that such an antenna is not possible. Indeed getting on 80 metres can be a real problem. In this issue we look at two compact antennas for that band.

In 1968 the May issue of our sister journal, Break-in, carried an article by ZL1AYN on a mini antenna for 3.5 MHz. It found its way into Pat Hawker's Amateur Radio Techniques, (p 212 in the 4th Edition). It was, in essence, a 30 foot (9.1 m) length of open wire line with the far end shorted. A spacing of 6 inches (150 mm) was used. One of the wires was connected directly to the output of the pi coupler and the other through a variable inductor to ground. It reportedly worked much better than just a 30 foot length of wire. It could be considered to be either a shortened half of a folded dipole or a narrow loop. Opening the loop out would increase the efficiency and radiated signal. This is what Richard, G2BZQ, has done.

The March 1992 issue of ELEKTOR ELECTRONICS carries an article "The Flat-top Antenna" which is intended for apartment dwellers, although it is suitable for any restricted space application. The antenna consists of a thin rectangular loop and feeder constructed from 14 m of PVC covered 7/0.2 stranded copper wire. The loop is again narrow and rectangular, being 5.6 m by 0.36 m. The open end is fed with home-brew open wire line with 125 mm spacing. The last portion of the line is expanded to connect to the loop.

The loop is mounted horizontally and held in shape by spreaders made from the sprung edging plastic strip available in hardware stores. As shown in the sketch the feeder is only 1.2 m long and the last 0.6 m of the loop is bent down.

A resonator or ATU is used to couple the transceiver to the loop. It consists of a parallel tuned circuit with the 50 ohm point being tapped on to the coil. The loop and feeder actually form part of the coil inductance. Richard suggests slinging the antenna diagonally across the room and using thin nylon cords for support. The length of the loop should not be changed but the amount that is bent can be adjusted to suit the room size. For external mounting more rigid spreaders are suggested. A ground connection is also strongly recommended but may not be essential.

When installed inside Richard suggests that no more than 10 W of rf be used. This would reduce the interference potential as well as minimising any concern over exposure to rf fields. For outdoor

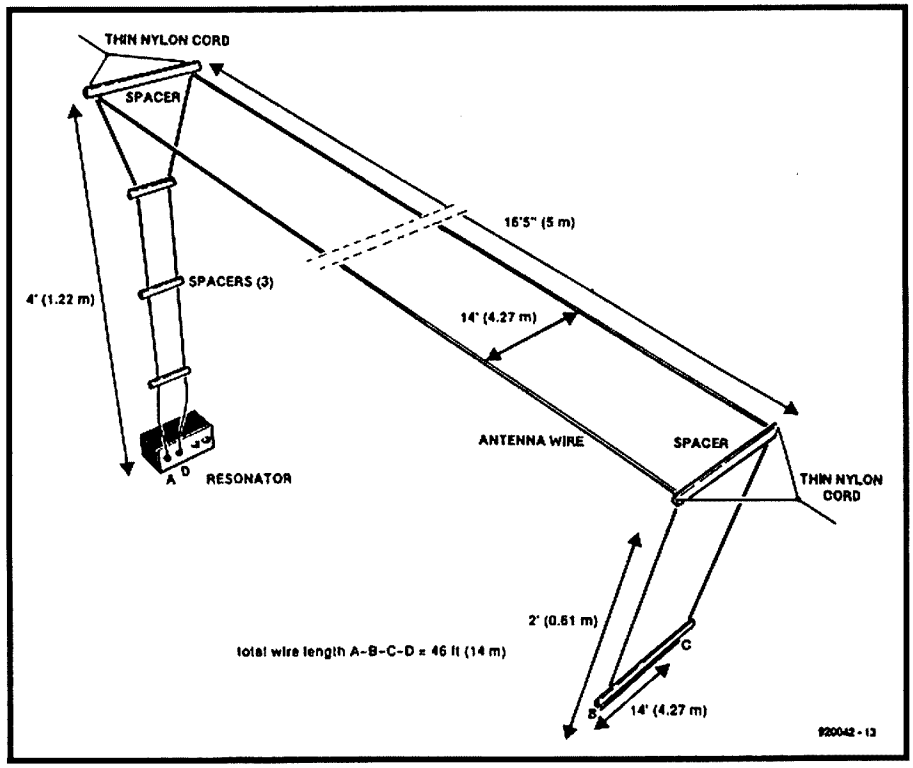


Fig. 2 The G2BZQ flat-top 80 m antenna.

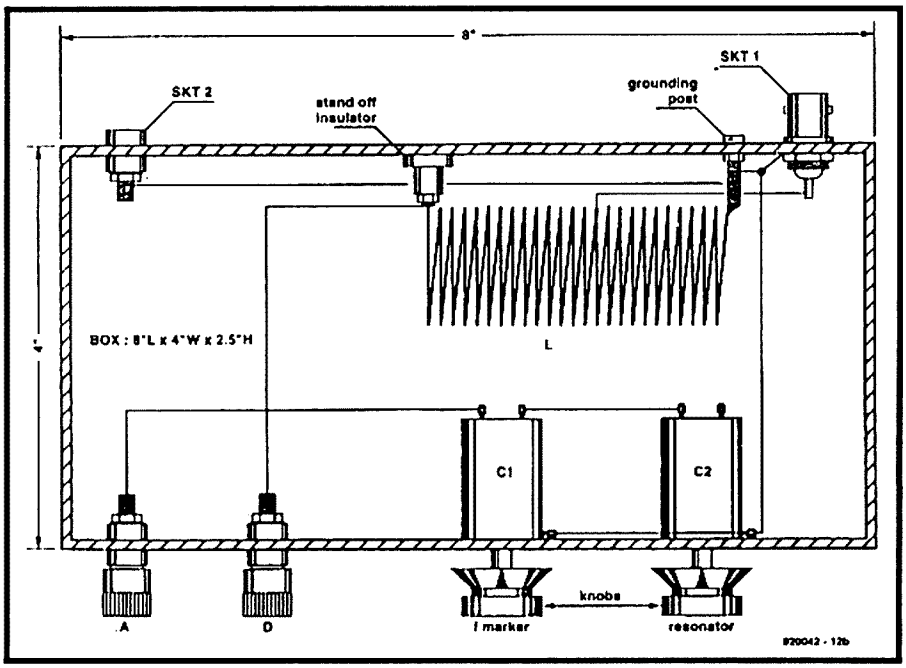


Fig. 3 G2BZQ ATU layout.

installation the basic rule of "the higher the better" applies so a longer feeder will be required. It will very likely then be necessary to use less turns for the resonator coil. Some adjustment of the coax tap may also be required to minimise the SWR. Experimenters might like to try increasing the width of the loop as well.

The Slinky Spiral Compact Antenna

In the November 1992 issue of the same journal the same author published an article titled "A Compact Spiral T/R HF Antenna". According to Richard, back in the 1970's a walking toy known as a Slinky was marketed in the USA. It was a coil of steel wire about 20 m long wound up into 90, 7 cm diameter close spaced turns. It would hop about and could "walk" down stairs. Apparently Slinkys are still manufactured by James Industries Inc. Hollidaysburg, PA 16648, USA.

Fortuitously, a Slinky can be made to resonate on 7 MHz by stretching it slightly. A company in the USA, Antenna West, (1500 North 150 West, Provo UT 84604) sells a kit of parts to make 7 or 14 MHz dipoles. Richard obtained two Slinky coils and joined them together. A nylon cord was passed through the centre of the coils and slung across the diagonal of a room. A 1.5 m single wire line was connected to the near end and fed to an ATU. A second nylon cord was used to pull the coils out to a length of 4.6 m, which is resonant in the 80 m band. A good earth connection is necessary. Quarter wave radials could be used as an alternative in high rise locations, but would need to be inductively loaded to achieve a practical length.

The ATU used by Richard was the familiar T match with two 250 pF capacitors and a tapped 26 μH inductor.

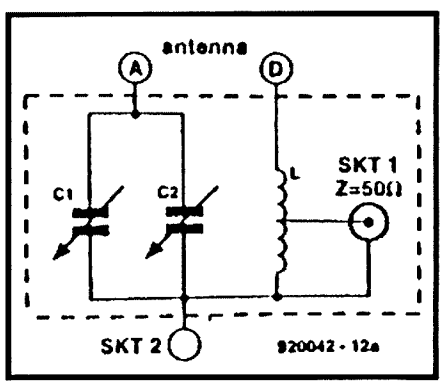


Fig. 4 ATU for G2BZQ 80 m flat-top L1 = 19 turns of 16 SWG (1.6 mm dia) copper wire wound on a 25 mm plastic former, turns spaced 2.5 mm. Tapped at 10.75 turns from the bottom.

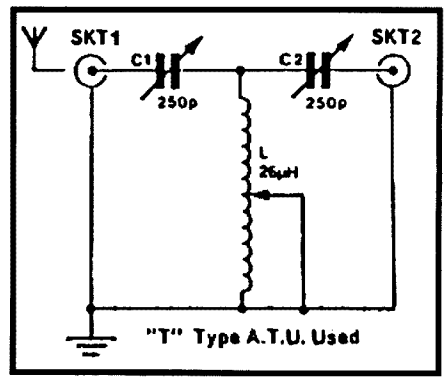


Fig. 6 ATU for use with G2BZQ compact spiral antenna.

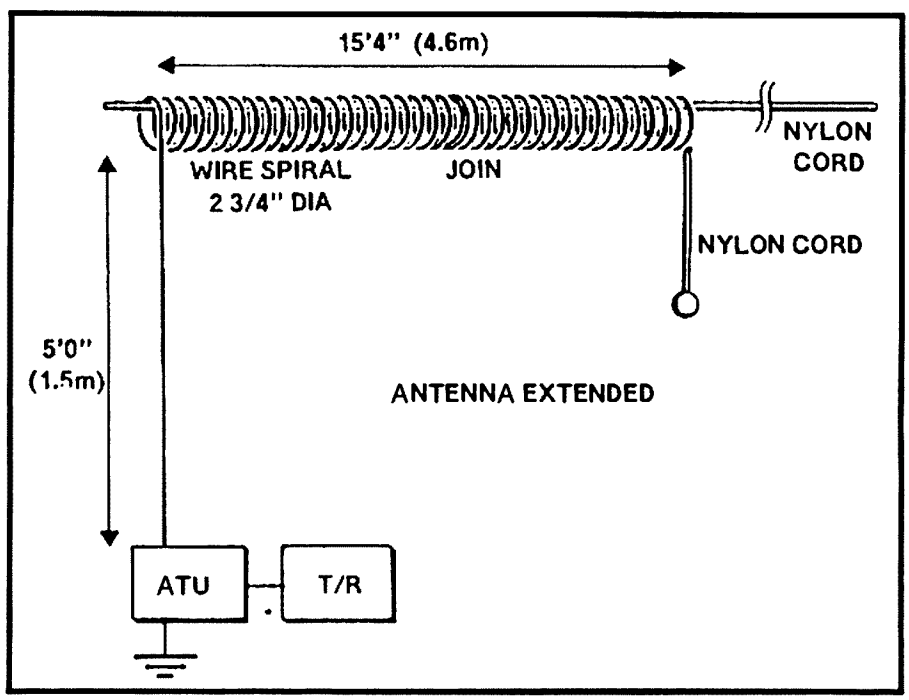


Fig. 5 The G2BZQ compact spiral HF antenna.

Mobile Magnificence!

Deluxe Handheld FM Paging Transceivers

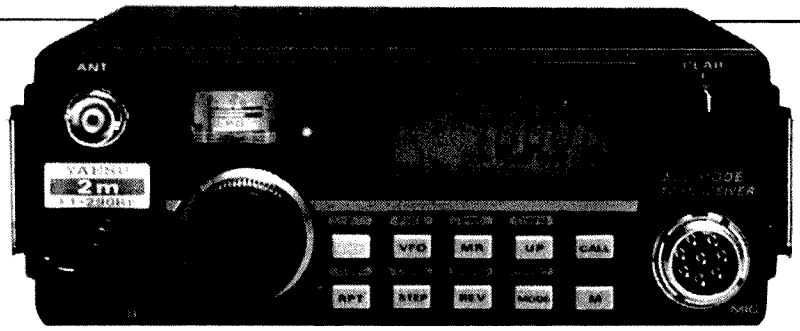
The superb FT-415 and FT-815 hand-held FM transceivers are compact and rugged with dual-microprocessor control, a range of new high-speed automatic battery-saving (ABS) features and power output which is selectable in up to four levels at 12V. A die-cast rear case, polycarbonate front panel and battery case (plus rubber gasket seals around controls and connectors) ensure reliability in the most demanding of environments. The display and keypad can both be backlit for easy night-time viewing and the 5.5-16 volt DC supply jack on the top panel can be used to power the transceiver and charge a 7.2V NiCad battery pack. A 36mm speaker provides low distortion audio, while in-built VOX circuitry is included for use with the optional YH-2 headset. Advanced features include two independent VFOs, keypad frequency entry, 41 tunable memories, instant recall CALL channel, and scanning (with programmable sub-band limits, scan skip/resume and priority monitoring). The FT-415 has Automatic Repeater Shift (Australian version), which activates whenever you tune to a standard repeater sub-band, plus extended receive coverage. Both have DTMF-based selective calling and paging facilities which allow you to program a 3-digit ID code so other transceivers can 'page' your transceiver. Comes with a high-capacity 7.2V, 1000mA/H NiCad battery, belt-clip, carry case and approved AC charger.

FT-415 Cat D-3610 **$599**

FT-815 Cat D-3615 **$699**

Specifications:

Frequency range:	FT-415 144-148MHz (140-174MHz extended receive) FT-815 430-450MHz
Size:	55 x 146 x 33mm
Transmitter:	
Power Output:	FT-415 2.0W (at 7.2V) FT-815 1.5W Both models 5.0W at 12V
Receiver:	
Sensitivity:	better than 0.158uV.(12dB SINAD) both models, Ham bands only
Selectivity:	>60dB (adjacent channel)



FT-290RII 2m Multi-Mode Transceiver

The multi-mode, transportable transceiver for serious field or mobile operations! The FT-290RII features FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM, while mode-specific features such as a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make these units very simple to operate. Each unit comes with an FBA-8 battery holder for nine "C" size standard or NiCad batteries (not supplied), antenna and hand-held microphone. FT-290RII with flexible rubber antenna covers 144-148MHz.
Cat D-2875

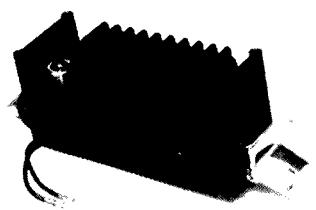
2 Year Warranty! **$999**

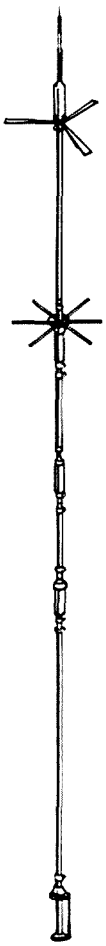
YAESU

FL-2025 Amp

Turn your FT-290RII into a powerful mobile/base transceiver with the FL-2025 amplifier. This clip-on RF amplifier will replace the FBA-8 battery holder on the FT-290RII and boost the transceiver's output to 25 watts. Requires 13.8V DC
Cat D-2863

$299





HUSTLER

Rugged HF 5-Band Trap Vertical Antenna

The tradition continues! The 5BTV is yet another masterpiece from the people who have been making antennas for over 33 years. This rugged 5-band HF trap vertical uses Hustler's exclusive trap design (25mm solid fibreglass formers, high-tolerance trap covers and low-loss windings) for accurate trap resonance with 1 kW (PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, less than 2:1 SWR at band edges), with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands. High-strength aluminium tubing and a 4mm (wall thickness) extra heavy-duty base section provides optimum mechanical stability. What's more, stainless-steel clamps and hardware guarantee a longer life. At just 7.65m, the 5BTV can be ground-mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50 ohm coax cable.
Cat D-4920

$349

Made In USA

30m Resonator Kit

Adds 30m coverage and includes all hardware.
Cat D-4921

$89.95

VRK-1 Radial Kit

Provides a 5-band ground-plane for above-ground antenna mounting positions.
Cat D-4922

$69.95

2m/70cm Magnetic Mobile

The black TM-723M is a slimline, compact dual-band mobile antenna that's supplied with a low-profile magnetic mount and low-loss coax cable, making it ideal for city drivers who can't use a long antenna. While only 0.7m high, it provides 1.7dB gain on 2m and 4.7dB gain on 70cm and has a conservative maximum power rating of 50W
Cat D-4812

$69.95

SAVE $20

2m/70cm Mobile Antenna

The ST-7500 is a high-quality medium-sized dual-band antenna that uses a ground-independent design and tillable stainless steel whip structure to provide excellent mobile results. It's just 1m long, yet provides approximately 3dB gain on 2m and 5.5dB gain on 70cm with a maximum power rating of 150 watts. Requires an SO-239 antenna base or SO-239 magnetic base.
Cat D-4810

$79.95

2m/70cm Hi-Gain Mobile

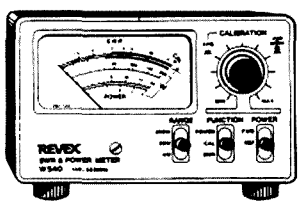
The ST-7800 is our best long-range dual-band mobile antenna, providing high gain (4.5dB on 2m and 7.2dB on 70cm) while only 1.5m in length. It incorporates an inbuilt tilt-over mechanism and has a maximum power rating of 150 watts. The ground-independent design also allows the use of gutter or boot/bonnet brackets for easier mounting. Requires an SO-239 antenna base.
Cat D-4815

$119.95

SAVE $10

VHF/UHF Power/SWR Meter

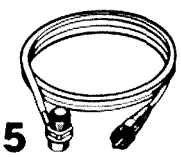
A high-quality SWR/Power meter suitable for amateur, UHF CB and commercial applications. High-quality Japanese construction assures you of maximum reliability. It has an all-metal case, large meter display, 140-525MHz coverage with less than 0.3dB insertion loss, and 4W, 20W & 200W power scales.
Revex model W540.
Cat D-1370



$199

SO-239 Base/Lead Set

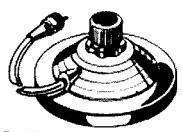
A convenient way to mount a PL-259 type antenna. This quality Japanese SO-239 base is pre-wired with 4m of low-loss coax cable and has a PL-259 already fitted for connection to your transceiver.
Cat D-4052



$29.95

SO-239 Magnetic Antenna Mount

A powerful Japanese magnetic mount for use with PL-259 antennas. It's supplied with 4m of quality coax cable and fitted PL-259 plug. Suits small to medium antennas such as the ST-7500.
Cat D-4520



$59.95

PHONE, FAX & MAILORDER SERVICE
Outside Sydney (FREE Call) 008 22 6610
Sydney And Enquiries - (02) 888 2105
FAX: (02) 805 1986 or write to
Dick Smith Electronics, Mail Orders, Reply Paid 160
PO BOX 321 NORTH RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.
Yaesu stocks and some antennas not held at all stores, please contact your local store for availability, or phone 008 22 6610

DICK SMITH ELECTRONICS

NSW • Albury **21 8399** • Bankstown Square **707 4888** • Blacktown **671 7722** • Brookvale **905 0441** • Bondi **387 1444** • Campbelltown **27 2199** • Chatswood Chase **411 1955** • Chullora **642 8922** • Gore Hill **439 5311** • Gosford **25 0235** • Hornsby **477 6633** • Hurstville **580 8822** • Kotara **58 2092** • Liverpool **600 9898** • Maitland **33 7666** • Miranda **525 2722** • Newcastle **61 1998** • North Ryde **878 3855** • North Sydney (Greenwood Plaza) **964 9467** • Orange **616 400** • Parramatta **689 2166** • Penrith **32 3400** • Railway Square **211 3777** • Sydney City **267 0111** • Tamworth **66 1711** • Wollongong **26 3600** **ACT** • Belconnen **(06) 253 1785** • Fyshwick **280 4944** **VIC** • Ballarat **31 5433** • Bendigo **43 0388** • Box Hill **890 0699** • Coburg **383 4455** • Dandenong **794 9377** • East Brighton **592 2366** • Essendon **379 7444** • Frankston **783 9144** • Geelong **232 711** • Highpoint **318 6300** • Melbourne City 399 Elizabeth St **328 6066** & 246 Bourke St **639 0398** • Richmond **426 1614** • Ringwood **879 5336** • Springvale **547 0522** **QLD** • Booval **282 8200** • Brisbane City **229 9377** • Buranda **391 6233** • Cairns **311 515** • Capalaba **245 2670** • Chermside **359 6255** • Maroochydore **791 600** • Rockhampton **27 9844** • Southport **32 9033** • Toowoomba **36 4300** • Townsville **72 5722** • Underwood **341 0644** • **SA** • Adelaide City **232 1200** **347 1900** • Elizabeth **255 6099** • Enfield **260 6066** • St. Marys **277 6977** • Westlakes **235 1244** **WA** • Cannington **451 6666** • Fremantle **335 9733** • Perth City **481 3281** • Midland **250 1460** • Northbridge **328 6944** **TAS** • Hobart **31 0600** • Launceston **344 555** **NT** • Darwin **81 1977**
STORES ACROSS AUSTRALIA AND NEW ZEALAND

Stores in red are open Sundays

YAESU

OPEN DAY!

Saturday 13th November 1993 ONLY

HUGE Savings On Ex-Demo Gear!

OFFICIAL LAUNCH - The New Yaesu FT-530 2m/70cm dualband handheld will be on display, with a sneak preview of the new FT-2200 2m mobile transceiver.

On-Air Demonstrations

- Special Prices on new and ex-demo equipment, with some items below cost!
- Display of C.A.T. (Computer Aided Transceiver) software.
- Qualified Amateur Staff for advice and assistance
- Huge range of all the latest Yaesu equipment on display, plus a large range of antennas and accessories.
- Bring your licence with you for On-Air demonstrations
- It's under cover, so come along rain or shine!
- Light refreshments available
- See a selection of great value IBM compatible computers.

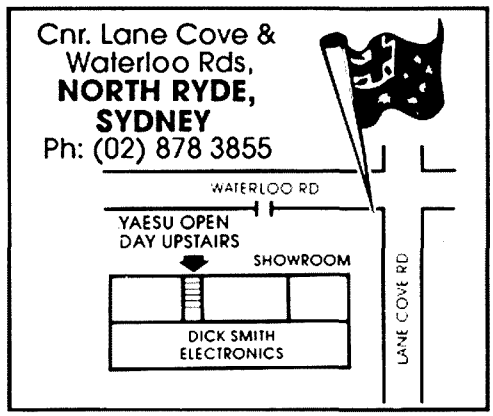
SUPER SAVER HOTLINE
Ph: (008) 02 3591 FREE CALL

The easy to save! Just phone us on our special One Day Only toll-free number between 9am and 4pm (Sydney time). We'll quote you our Open Day Special Price on new or ex-demo equipment. Simply quote your credit card number and we'll forward your purchase promptly to you. (Post and packaging extra).

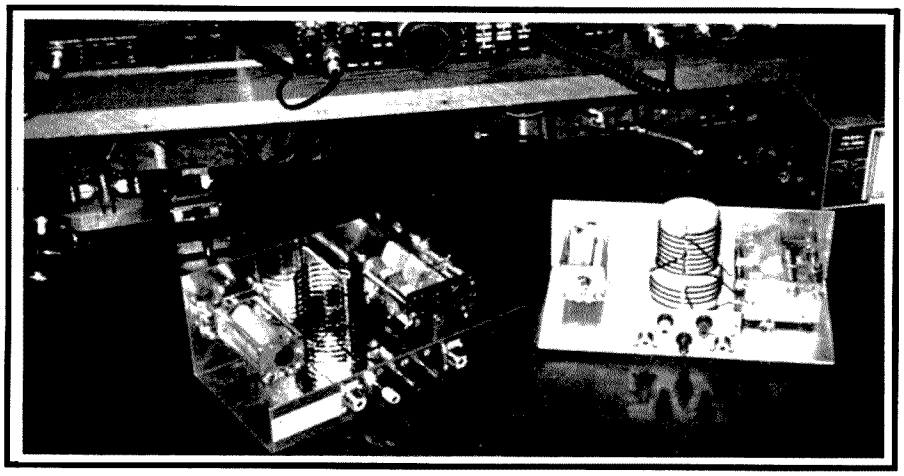
Plenty Of On-Site Parking

Lucky Door Prizes

Cnr. Lane Cove & Waterloo Rds,
NORTH RYDE, SYDNEY
Ph: (02) 878 3855



DICK SMITH ELECTRONICS



The Mk2 perspex former (left) and the Mk1 plastic pipe former Z matches constructed by Wes VK2WES.

Z-Match Comments

And finally, a letter from Wes VK2WES who writes as follows.

"After reading with interest the construction and test details by yourselves and Lloyd Butler of the "AR single coil Z-match", I constructed both the plastic pipe Mk1 and perspex Mk2 coil former models. Both are very satisfactory performers, with the Mk2 having the edge (probably biased because of the vernier controls). Identical capacitors were used on both and they are wound with 2 mm (14 gauge) enamel insulated copper wire (unable to obtain tinned material) and mounted on simple aluminium chassis. Both are very convenient to use and settings are accurately duplicated time after time. Testing has been carried out, initially using a 50 ohm load and then a G5RV (height above ground only 3 m!!), followed by a Werner Wulf multiband vertical (ground mounted) and finally a Windom fed half square dipole up 10 m. The results are excellent and parallel those of Lloyd's tests. My commercial tuner has been retired and I am using the Mk2 exclusively. Many thanks to you all for a very worthwhile project. For your information I have included a photo of them both."

Thanks Wes for sharing your experience and for those kind remarks.

So that's it for this time and it's 73 from him and 73 from me.

The two Rons.
ar

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-Ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

100th Issue of Amsat-VK newsletter

Congratulations to Graham VK5AGR on the production of the August 1993 issue of the Amsat-VK newsletter which was the 100th issue. One of my prized possessions is a complete set of these newsletters which date back to March 1985. They constitute a great historical record of the progress of amateur radio satellites over those years. Great work Graham. I guess the next milestone will be the 10th anniversary issue!

New Satellite launches

It has been reported from AMSAT Italy that ITAMSAT-A is currently in Kourou for final integration with the Ariane 4 launch vehicle.

The planned launch date is currently 21st Sep 1993. The orbit will be sun-synchronous with an altitude of 800 km. This satellite will share many of the characteristics of the previous MICROSATs except that it will have the capability to allow the user to employ either 1200, 4800, or 9600 baud on both the uplink and the downlink. It will have the usual "store-and-forward" bulletin board system.

Operators who are currently set up to use AO-16, LO-19 or UO-22 will not have to make any changes to their stations to work ITAMSAT-A. The modes and frequencies of operation are as follows:

Downlink:	435.867 MHz (primary)	PSK 1200 baud
	435.822 MHz (secondary)	PSK 1200 baud
		AFSK 1200 baud (FM)
		9600 baud (G3RUH)
		analog transponder (FM)
Uplink:	145.875 MHz 1200 baud Manchester/4800 baud	
	145.900 MHz 1200 baud Manchester/4800 baud	
	145.925 MHz 1200 baud Manchester/9600 baud /exper	
	145.950 MHz 1200 baud Manchester/9600 baud	

The maximum downlink power will be approximately 4 watts and the antennas will be a 4 element slanted turnstile for UHF and a 1/4 wavelength VHF "dipole". The satellite weighs about 10 kg and is about 25 cm in length on each side of its cube shape. On the same launch will be three other satellites of interest to amateurs.

EYE-Sat, a commercial micro-satellite will carry an amateur radio package built in co-operation with AMRAD, an experimentally oriented radio club in the Virginia suburbs of Washington, DC. This package is understood to incorporate both 9600 baud uplink and downlink and a 19.2 kilobaud experimental downlink. Uplink and downlink frequencies have been stated as 145.850 and 436.800 MHz respectively.

Also on the same launch will be two satellites built at the University of Surrey in England. One is KITSAT-B, which is similar to KITSAT-OSCAR 23 and the other POSAT, a satellite built with Portuguese co-operation. The latter will include an earth imaging camera which should provide amateurs with expanded opportunity to download pictures from space. It is also said to include a GPS experiment which may provide valuable data for the use of GPS on Phase 3D.

MIR educational developments

Listeners to the recent series of early morning passes of MIR will have been able to listen in on a fascinating series of exchanges between Aleksandr and Steve VK3CAX. Aleksandr has been reviewing work done by students in Steve's year 12 physics class at Hamilton College. This could well be a world first. Imagine this. You are a student in a rural Victorian town and suddenly you have the opportunity to "bounce your ideas off" a Russian cosmonaut on board an orbiting spacecraft who just happens to be a Professor from the Institute of Physics and Technology in Russia. You are able to send YOUR calculations up to him, get his reaction and incorporate his suggestions

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of August 1993.

G7MNI	MR P CHARLTON
L20956	MR R A FRASER
L30863	MR W ELDRIDGE
L30864	MR T CUPIC
L40325	MR P FOSTER
L40326	MR A CHIANG
L40327	MR J B BRITNELL
L40328	MR J S STRAKER
L50307	MR R J J MAUMILL
L60330	MR A K HILL
L70113	MR J W BATES
L70114	MR W A STUBBINGS
L70115	MR S R BEATTIE
VK1MTB	MRS B OLDS
VK2ARR	MR I SPOLJARIC
VK2BC	MR S R HAYWOOD
VK2DMP	MR R M S MENDONCA
VK2MNA	MR D R EDWARDS
VK2TCV	MR J A GLEAVE
VK3AHD	MR A LAITY
VK3ARB	MR R O BLACKSHAW
VK3ATH	MR H HOLMES
VK3BAW	MR H HANSON
VK3BRX	MR G HANNAKER
VK3DO	MR M MACISZEWSKI
VK3ENT	MR A SOLOMON
VK3EQL	MR S J DE VOS
VK3FSD	MR J COOMBES
VK3JHO	MR P MURPHY
VK3PDX	MR D HELYAR
VK3RZ	MR M ROSS
VK3TOI	MR F MENTIPLAY
VK3TRE	MR P D WESTGARTH
VK3VEB	MR E BARCO
VK3ZDW	MR G WHITE
VK4NJE	MR N J EIJBERGEN
VK4UO	MR R JOHNSON
VK5BT	MR R C BENNETT
VK5JLH	MR J L HENRY
VK6MAP	MR M A P PERRY
VK7AZ	MR D E PARISH
VK7LDM	MR D S PONSONBY

into your experiments, exchanging data with him as the experiment continues. All this via amateur radio. Great work, Steve, and congratulations to the students involved. Aleksandr has a good command of English and quite a sense of humour. He was heard to refer to himself as "an absent minded professor". Aleksandr is photographing natural phenomena such as cyclones and volcanoes from his orbiting vantage point using a video camera with tele-photo lens. He will be using this material for a series he is putting together called "Lessons from Space".

Amsat-UK symposium

This annual event has come and gone for 1993. From all accounts it was again a huge success. One interesting observation conveyed in a recent packet bulletin was (unofficial) concern over the growing number of satellites with digital capability and how to make the most efficient use of them. This problem exists already with lots of duplication of files, etc on the current digital birds. It's a problem crying out for a solution. Hopefully it will be addressed in the near future and some sort of "Gentleman's agreement" reached so that all users can benefit from the fantastic facility that these birds represent.

Arsene experiences its first shut-down

As this column goes to press Arsene has been shut down to prevent over-heating. This is due to orbital characteristics presenting a particular face to the sun for long periods. It may well become a feature of the on-going management of the satellite to have short periods of shut down. In the meantime the list of users is growing and the variety of rigs and, in particular, antennas is of interest. Some stations appear to be using quite modest antennas. One listed a hand held helix. The main problems appear to be the fact that the radiation pattern of the on-board antennas is quite sharp and that the frequency is way outside the normal bottom edge listening window on S band. Converter efficiency falls off at the top edge of this band where the Arsene downlink is situated and it calls for a specially designed converter for the 2450 MHz end of the band. The sharpness of the antennas restricts the times when good QSOs can be made. As more activity is reported these times will become better known.

English amateur to build 2 metre transmitter for phase 3D

An announcement was made at the recent Amsat-UK colloquium that a high power 2 metre transmit module would be jointly sponsored by Amsat-UK and Amsat-NA. It was feared that such a device would not fly on phase 3D as no definite offers had come forward for its construction. However, Mike Dorset G6GEJ has made a submission to the crew at Marburg and it has been decided to authorise him to go ahead with construction to his design. This means that with the planned matrix switching it will be possible to have a mode B option on this satellite.

*359 Williamstown Rd Yarraville VIC 3013
Packet: VK3JT@VK3BBS

ar

ALARA

*Robyn Gladwin VK3ENX**

Pixie Chappie VK2KPC at the 2nd Riverina Field Day

ALARA Banner Flies Again

Many thanks to Barry Gilmour VK2KUZ for the kind invitation to represent ALARA at the 2nd Riverina Field Day held recently by the Wagga Wagga Amateur Radio Club. The venue was the Murrumbidgee Turf Club and Barry was ably assisted with the organisation of the event by his wife, Anne VK2MKJ. A dinner was held to mark the 25th anniversary of the Wagga Wagga Amateur Radio Club, at which Bill Roper VK3BR was the guest speaker. It gave me great pleasure to meet Pixie Chappie VK2KPC, pictured at the Field Day, for the first time.

Silent Key VK5CKP

It is with great sadness that we record the loss of ALARA member Irene Wilson VK5CKP. She was an enterprising, literate lady with a delightfully supportive (non-amateur) husband and talented children and grandchildren.

Fluent in French, German and Italian, involved in Musica Viva, bridge, chess, Scrabble (in four languages), weaving and gardening, she was introduced to amateur radio by Colin Heath VK5FX. She attended her first ALARA luncheon in 1991. By the '92 lunch she was already VK5KCP and working for her full call which she acquired in August 1992.

With an iambic paddle and practice QSOs supplied by Colin, she was increasing her speed and confidence in this, her fifth language. Sadly, she died before she could enjoy her third ALARA luncheon. In such a short time she did so much! 88/33 Irene.

Sincere thanks go to Denise Robertson VK5YL for this tribute. Irene Wilson was 80 years old when she obtained her Amateur Operator's Certificate of Proficiency and she will be remembered as an inspiration to all who seek to attain excellence.

*PO Box 438 Chelsea 3196 VK3ENX@VK3YZW

ar

AWARDS

*John Kelleher VK3DP — Federal Awards Manager**

Redcliffe and Districts Radio Club Awards

The following award information is for Awards sponsored by the Redcliffe and Districts Radio Club. The Redcliffe City Award has over 750 recipients in 57 countries whilst the Basic grade of the Rally Australia Award has been presented 14 times and the Enhanced grade 5 times within VK and ZL.

Redcliffe and Districts Radio Club Rally Australia Award

1. The object of this award is to travel around Australia by radio, making progressive contacts as you go. Valid contacts are those made on or after 1st October 1986.

2. The award is available in two grades:

(a) The BASIC Award is a two colour certificate printed on parchment style card.

(b) The ENHANCED Award is an etched aluminium Plaque in gold on a black background. It will be engraved with the recipients details.

3. The two grades are totally separate awards. It is not necessary to complete the BASIC award before attempting the ENHANCED award. Contacts made for one award do not count toward the other.

4. BAND and MODE endorsements are available.

5. Shortwave listeners are eligible to participate in these awards. These rules, with the inclusion of the callsigns of both stations logged, apply.

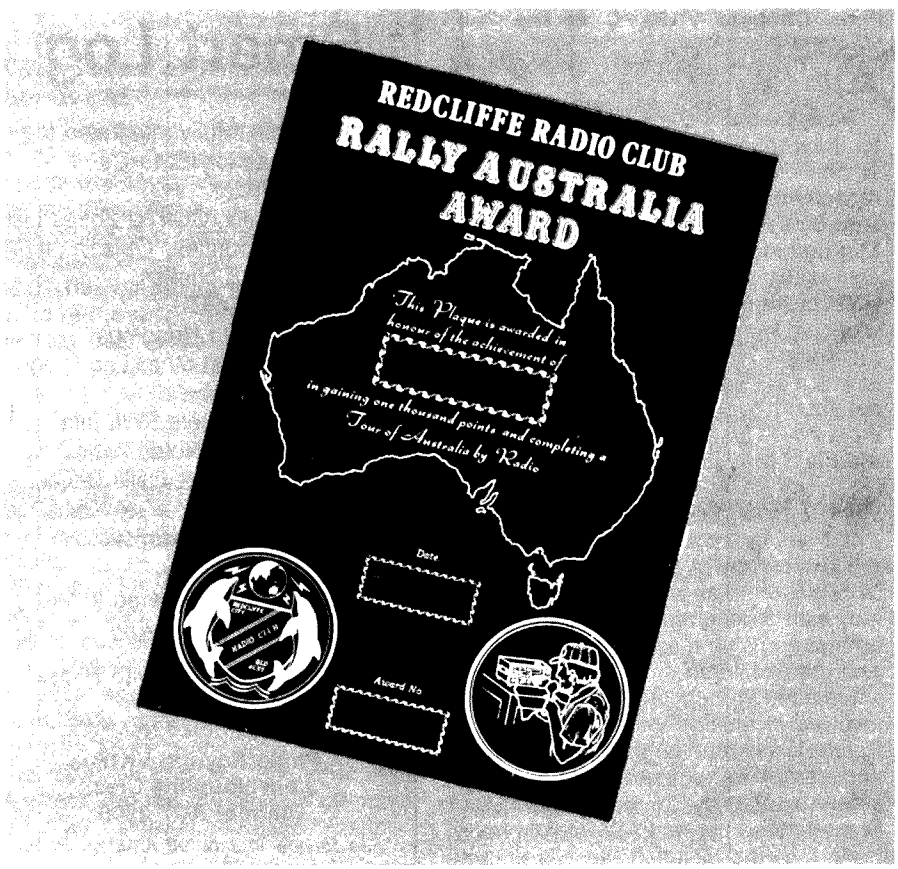
6. Basic Rally Australia Award

(a) This award requires contacts with 25 Cities and Towns around Australia.

(b) The FIRST and also the FINAL contact must be with a Redcliffe member. These contacts are deemed to be the Redcliffe check point regardless of the members QTH.

(c) THE FOLLOWING CITIES ARE MANDATORY CHECKPOINTS : Redcliffe, Brisbane, Sydney, Canberra, Melbourne, Hobart, Adelaide, Perth, Darwin, Mt Isa, Townsville, Redcliffe.

(d) A further 2 contacts in each of VK2, VK3, VK4 VK5 and VK6 with a further 1 contact in each of VK1, VK7 and VK8. These contacts must be made in progressive order with the mandatory contacts.



(e) The rally may be run in either direction (ie Redcliffe — Sydney or Redcliffe — Townsville etc).

7. Enhanced Rally Australia Award

(a) This award requires the accumulation of 1000 points from progressive contacts throughout Australia.

(b) Contact with the mandatory checkpoints (as per the BASIC award) are required.

(c) Points are awarded as follows for contacts within: VK1...20pts, VK2...10pts, VK3...10pts, VK4...10pts, VK5...10pts, VK6...10pts, VK7...20pts, VK8...20pts.

8. Applications

(a) Applications for these awards should be accompanied by a certified log extract, signed by two other Amateurs, showing date, time, frequency, callsign and location of station worked.

(b) The cost of the BASIC Award is $A4.00 or 6 IRCs.

(c) The cost of the ENHANCED Award is $A25.00 or 36 IRCs.

(d) Applications for these awards should be sent to: The Awards Manager, Redcliffe & Districts Radio Club, PO Box 20, Woody Point, QLD 4019.

9. Contact Information

(a) Contact with a Redcliffe member is only required for the start and finish contact. Any licensed Amateur may be worked for all other contacts.

(b) The Redcliffe club conducts a net every Sunday on 3.612 MHz at 0930 z under the callsign VK4RC. Club station VK4IZ can also be heard in most VK contests. A list of members can be had by sending a SASE to the Awards Manager.

Redcliffe and Districts Radio Club Redcliffe City Award

1. The Redcliffe City Award requires an Amateur station in VK or ZL to contact Redcliffe club station VK4RC or VK4IZ and four club members to qualify.

2. Any Amateur station other than in VK or ZL requires contact with Redcliffe club station VK4RC or VK4IZ and two club members to qualify.

3. BAND and MODE endorsements are available.

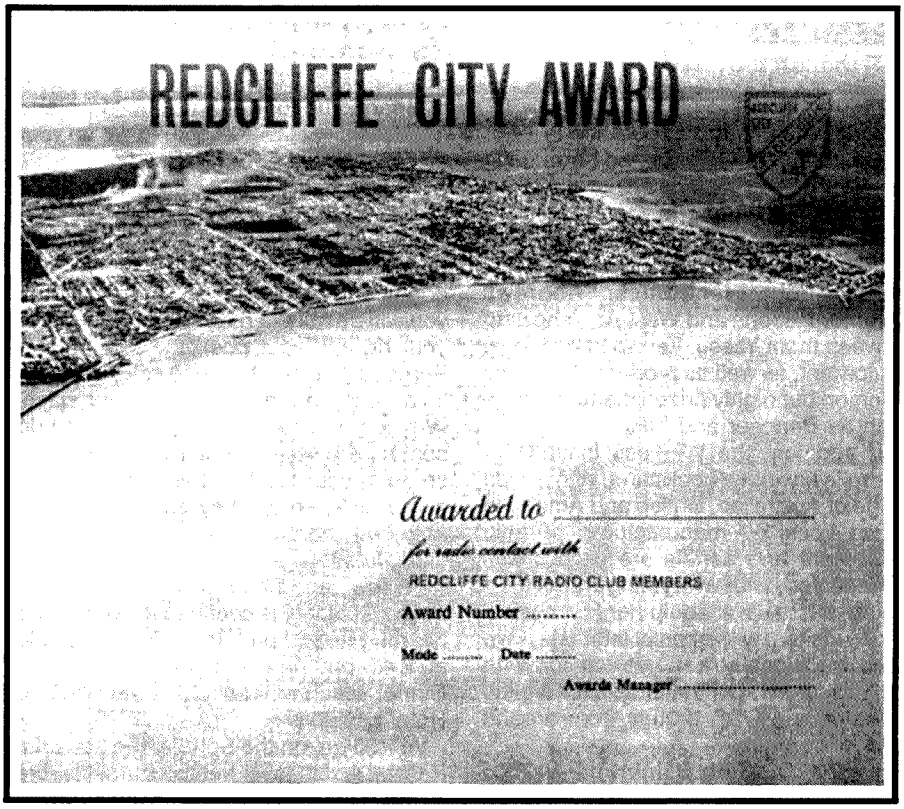
4. Shortwave listeners are eligible to participate in this award. These rules, with the inclusion of the callsigns of both stations logged, apply.

5. Applications

(a) Applications for this award should be accompanied by a log extract showing date, time, frequency, callsign and location of station worked.

(b) The cost of the Award is $A2.00 or 3 IRCs.

(c) Applications for these awards should be sent to: The Awards Manager, Redcliffe & Districts Radio Club, PO Box 20, Woody Point, QLD 4019.



6. Contact Information

The Redcliffe club conducts a net every Sunday on 3.612 MHz at 0930 z under the callsign VK4RC. Club station VK4IZ can also be heard in most VK contests. A list of members can be had by sending an SASE to the Awards Manager.

Belarus Award

Work UC or RC amateurs in the oblasts listed. 2nd class = 20 UC/RC in 3 oblasts. 1st class = 30 UC/RC in 4 oblasts. Oblasts in this area are:

005 L Brest
006 W Vitebsk
007 P Gomel
008 I Grodno
009 C Minsk
010 S Mogilev
188 A Minsk City

No band or mode restrictions. GCR list with 7 IRCs or equivalent to: Gene Zhukovski, Box 33, Minsk — 13, 220013, USSR.

Canada Award

Confirm 2 way contact with all Canadian provinces and territories. Endorsements for any band 160 — 6 metres, and any mode via OSCAR satellite. Modes may be mixed, all CW, SSB, or RTTY. Contacts after 1st July 1977. Send cards or GCR list plus $US8.00 to: CARF Awards Manager, PO Box 356, Kingston, Ontario, Canada K7L 4W2. Provinces and territories needed are:

VO1/VO2	Newfoundland and Labrador
VE1	Prince Edward Island
VE1	Nova Scotia
VE1	New Brunswick
VE2	Quebec
VE3	Ontario
VE4	Manitoba
VE5	Saskatchewan
VE6	Alberta
VE7	British Columbia
VE8	Nor/West Territory
VY1	Yukon Territory

The Labre Award — Brazil

The Labre Award is awarded for proof of contact with 45 or more countries of the American area. GCR list with 10 IRCs or equivalent. The qualifying countries are:

Sign up a new member today — We need the numbers to protect our frequencies and privileges.

Chile, Easter Is, Juan Fernandez, San Felix, Cuba, Uruguay, Guadeloupe, Martinique, Fr Polynesia, Clipperton Is, St Pierre & M, St Martin, Fr Guiana, Ecuador, Galapagos Is, Haiti, Dominican Rep, Columbia, Malpelo Is, San Andres Is, Panama, Honduras, Grenada, St Lucia, Dominica, USA, Navassa Is, Guantanamo Bay, Alaska, Puerto Rico, Desecheo Is, Virgin Is (US), Argentina, Greenland, Neth Antilles, Sint Maarten, Peru, Brazil, Fernando de Noronha, St Peter & Paul Rocks, Trinidade Is, Surinam, Guatemala, Costa Rica, Cocos Is, Canada, Belize, Antigua, Anguilla, St Kitts & Nevis, Montserrat, St Vincent, British Virgin Is, Turks & Caicos, Bahamas, Antarctica (VP8/LU), Falklands Is, Sth Georgia, Sth Orkney, Sth Sandwich, Sth Shetland, Bermuda, Mexico, Revilla Gigedo, Nicaragua, El Salvador, Venezuela, Aves Is, Cayman Is, Paraguay, Jamaica, Barbados, Guyana, Trin/Tobago.

There are no date requirements. 3 types of certificates are awarded for mixed phone/CW, phone, and CW. The address for submissions is: Labre Headquarters (Award Manager), PO Box 07-004, 70359 Brasilia DF Brasil

**PO Box 300 Caulfield South 3162*

ar

CLUB CORNER

Western Australian Hamfest 1990

The premium amateur radio, CB and electronics event in Western Australia will be held this year on Sunday 14th November, with bigger and better facilities at a new location. To deal with the increasing number of visitors to Hamfest from all over WA and interstate, the **Northern Corridor Radio Group** in Perth has moved the annual event to: The Len Hansman Community Centre, 246 Walter Road, Morley, WA, 6062.

The centre, opposite Coventrys, is about 7 km from the centre of Perth and offers covered facilities, in a large sports hall, for visitors and trade exhibitors. In addition there is extensive on-site car parking and ample room for our ever expanding Car Boot Sale.

For those of you who like to see the show but have old equipment to sell, the NCRG will be running its popular "Bring and Buy" stall, where we will sell your pre-loved radios for a modest fee. A refreshments stand will also be put on, as in past events, with pies, pasties, tea and coffee and soft drinks available, plus space to sit and chat.

We are encouraging exhibitors to offer "show specials", so why not save that purchase until Hamfest, when you should be able to see everything from the Yaesu FT-1000 to the Kenwood TS-50S, all within the space of 100 m!

The show opens to the public at 10 am, with trade access from 8 am. The entrance fee for visitors is $2, which also includes a ticket in the NCRG door raffle which will be drawn before the show closes at 4 pm.

There is a $20 fee for trade exhibitors showing in the hall, with tables being available for hire at $5 each (maximum of 3 per exhibitor). Those visitors wishing to sell equipment at the Car Boot Sale can buy space at $10 per car, in a specially designated uncovered sales area.

Trade bookings will be taken on a first with cash, first served basis and Keith Bainbridge VK6XH, the HamFest Organiser will be pleased to talk to you about your requirements on (09) 279 4923.

Talk-in is hoped to be provided from 0900, for the early hours of Hamfest, provisionally on 144.500 simplex or duplex — 146.025 (input)/146.625 (output) or 146.200/146.800.

Hamfest has been run by the Northern Corridor Radio Group for the last five years. Last year saw an estimated 500-plus visitors, with amateurs making the trip from as far away as NSW and Victoria, Albany and Esperance in WA's far South and the Pilbara and Karratha in the North.

All the big names in the trade have traditionally attended the event, with representation last year from Emtronics, Dick Smith Electronics, Andrews Communications and West-Am, showing between them Yaesu, Kenwood and Icom equipment, as well as products from less common but highly prized manufacturers such as Bencher and MFJ.

In addition, the Wireless Institute of Australia has run a bookstand, with a wide range of Australian, British and American books. Local WA manufacturers of radio equipment and aerials are always well represented, with everything from HF to CB to Microwave equipment available. Those visitors with special interests have been traditionally well catered for, with exhibits from UHF/Microwave, digital, repeater and QRP groups from around WA.

Keith Bainbridge VK6XH

Australian Naval Amateur Radio Society

Membership is growing steadily, Since our launch on 9th August 1993 the SMA has decided that the callsign VK1RAN should be returned to the overseas based RNARS and have issued the Australian Naval Amateur Radio Society with the distinctive callsign VK1SEA.

Close association is maintained with the Royal Australian Navy as this Society also has the callsign VK1VHP which will be used on special occasions. It is a suffix well known to all Navy and merchant navy communicators as VHP is the callsign of the Royal Australian Navy's main communication station in Canberra — HMAS Harman.

The ANARS conducts a regular "Navy Net" on 3620 kHz (+/– QRM) LSB every Wednesday evening commencing 1000 hours UTC (8pm EAST). All seafarers, past and present, are invited to join this net.

Terry Clark VK2ALG

Ballarat Amateur Radio Group Hamvention

Gearing up for the Xmas holidays and need that final piece of gear to set up your rig for those lazy days ahead?

Then the BARG Hamvention is the place where you ought to be on 30th and 31st October. Trade displays and bargain tables will have a host of new and used goodies for your perusal, and no doubt you will be able to make a purchase to fit your rig and your pocket.

Perhaps you might have to sell some pre-loved gear to make your new purchase. Why not hire some trestle space and do someone else a favour by selling them some of your tried and tested gear, and some junk, so as they can continue to enjoy our hobby, perhaps in a different field. Trestle space is available at $10.00 for 8 feet, and $7.50 for 6 feet.

The Saturday is confined to fox hunting (starting at 3.30 pm) and a 2 m scramble at 6.45 pm precedes the Hamvention Dinner which will be held at the Western Hotel at 7.00 pm.

At 9.00 am on the Sunday the beautiful Ballarat weather will set the scene for one of the best amateur radio events on the calendar.

Entrance to the venue will cost $5.00, or $10.00 if you elect to stay and enjoy a meal prepared by our hard working XYLs. You may even be lucky enough to win a door prize.

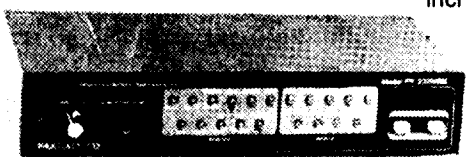
To make your booking for the Hamvention dinner on the Saturday evening, or to arrange trestle space, please contact the co-ordinator, Tom George VK3DMK, as soon as possible on 053 32 7234 and 053 35 5662 AH.

Club Net — All amateurs are reminded that they are welcome to participate in the club net at 2000 hours EAST on Thursday evenings on 3610 kHz +/– QRM. The net is usually well supported and you could become eligible for one of the club's three awards, one of which, the DX Widows Award, recognises your XYL's tolerance of your behaviour as you work that ever elusive DX. Details of the award are given during the net.

Norm D'Angri VK3LBA
ar

DATA PRODUCTS low cost

We have sold over 1200 PK-232 MBX
- The world's best multi-mode data controller **$750** incl pactor



PK-232 MBX Multi-mode Data Controller:

Most popular multi-mode controller ever made; RS-232 compatible controller for Packet, Baudot and ASCII RTTY, AMTOR/SITOR ARQ and FEC. Morse code and WEFAX; also receives NAVTEX/AMTEX and TDM: superior CHEBYSHEV filter design for better copy; built in 18K byte PakMail TM personal packet maildrop with auto forwarding; SIAM TM for automatic RTTY signal identification; KISS mode for TCP/IP compatibility; Host Mode for user-friendly software interface; cables and connectors included.

ROTATORS GALORE

Grab your Kenpro Rotator before the price hike!
Unstable Dollar will force increases in the near future!

KR 400
KR 400RC
KR 1000
KR 5400B
Dual Azmith/Elevation
Stay Bearings & Rotator Cable in stock

THE CLASSIC GREAT SPECIAL

All new - all band transceiver from Emtronics at 1980 prices

$899 BANDO - 5D

HF ALL BAND RECEIVER COMPLETE WITH MIC & BUILT-IN POWER SUPPLY

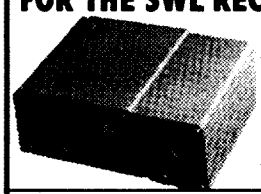
The transceiver is ideal for the newcomer as well as experienced operators. It operates from 80 through to the 10 metre band including WARC. It has an extremely sensitive receiver (0.25uV - 10dB S/N) and adjustable output power from a few watts to 220W PEP, NB, IF shift, RIT, RF Processor and many other features. This radio will suit everybody's requirements and pocket.

ICOM
KENWOOD
AT THE BEST PRICES IN ALL EMTRONICS STORES

ANTENNA ROTATOR PACKAGES - ONLY UNTIL 31/10/93

	R.R.P.	SPECIAL
KR-400 + TE-33	$1,175.00	$1,100.00
KR400RC + TE-33	$1,250.00	$1,175.00
KR400 + TE-23M	$1,100.00	$1.025.00
KR1000 + TE-HB-35C	$2,135.00	$1,950.00

FOR THE SWL RECEIVERS



★LOWE HF225
★LOWE HF 150
★KENWOOD R5000
★AR3000o
★ICOM R72
★ICOM R100

NEW MODEL IS HERE
AR-3000A

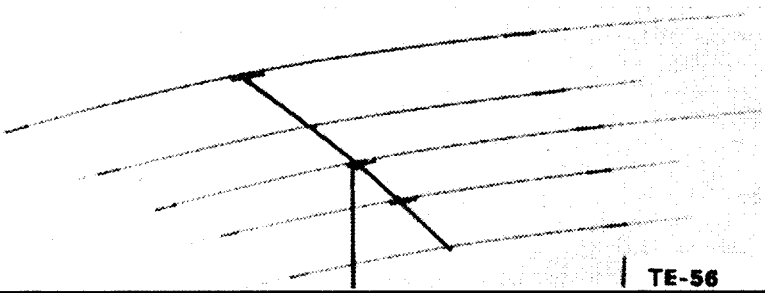
100KHz 2036 MHz CONTINUOUS
LF-MF-HF-VHF-UHF-SHF all mode AM-SSB-FM monitoring and surveillance
PROFESSIONAL RECEIVER
SBEST IN AUSTRALIA

ACCESSORIES

★BALUNS
★POWER//SWR Meters
★EMTRON EP2000
★Revex W560
★Revex W570
★Noise Bridge EMTRON ENB-2
★Power Supplies Kenwood from $430
★GME from $85
★ Co-ox switches ★ EMTRON TUNERS

TET-Emtron ANTENNA SYSTEMS

DESIGNED AND MADE IN AUSTRALIA



TE-56

ED-52C ALL BAND WIRE TRAP ANTENNA

* Completely factory assembled ready to use.
* Heavy 14 (7/22) guage standard copper antenna wire to survive those severe storms.
* Centre fed tuned feedline supplied.
* Only two traps
* Includes centre insulator with on eye hook for centre support.
* Incluudes custom insulators molded of top quality material with high dielectric qualities and excellent weatherability.
* Complete installation instructions included.
* Overall length 33 mtrs less when erected os an inverted vee or sloper.
* Handles 2 kw PEP & covers 80 through 10 metres **$179**

TET-EMTRON VERTICAL ANTENNAS
EV-3, 14-21-28 MHz, $149
EV-3W, ALL WARC BANDS, $189
NEW EV-5, 3.5-7-14-21-28 MHz
UNIQUE NEW ANTENNA - $299

WORLD'S LARGEST SELECTION OF HF-BEAM ANTENNAS

TE - 3 BAND SERIES

TE-23	2 element 3 band 14/21/28	$414.00
TE-23M	2 element 3 band mini 14/21/28	$440.00
TE-33	3 element 3 band 14/21/28	$575.00
TE-43	4 element 3 band 14/21/28	$750.00
HB-35C	5 element trapless 14/21/28	$990.00

TE - 4 BAND SERIES

TE-34	3 element 14/21/28 1 element 7Mhz	$695.00
TE-44	4 element 14/21/28 1 element 7Mhz	$870.00
TE-433HB	3 element 14/21/28 2 element 7Mhz	$850.00
TE-443HB	4 element 14/21/28 3 element 7Mhz	$1100.00

TE - 6 BAND SERIES

TE-26	1 elem 14/21/28 1 elem 10/18/25	$380.00
TE-46	3 elem 14/21/28 1 elem 10/18/25	$750.00
TE-56	3 elem 14/21/28 2 elem 10/18/25	$1075.00

TE - 7 BAND SERIES

TE-47 3 elem 14/21/28 1 elem 10/18/25 1 elem 7Mhz $995.00
TE-57 3 elem 14/21/28 2 elem 10/18/25 1 elem 7Mhz $1200.00

BANKCARD MASTERCARD & VISA

EMTRONICS

MAIL ORDERS WELCOME

SYDNEY STORE & HEAD OFFICE
94 Wentworth Ave,SYDNEY
PO Box K21 HAYMARKET,2000
Ph:(02)211 0988 - 3 lines
Fax:(02) 281 1508

VICTORIA
John Hill
(03) 700 5428

QUEENSLAND
633 Logan Rd,GREENSLOPES 4120
Ph:(07) 394 2555
Fax: (07)394 4316

WESTERN AUSTRALIA
Shop 3,443 Albany Highway,VICTORIA PARK 6100 Ph: (09) 470 1118
Fax: (09) 472 3795

NZ AGENT
Pottinger Business Services
Ph: 4-567 1842 Fax: 4-567 1842 (request)

Contests

*P Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Oct-Dec 93

Oct 2/3	VK/ZL/Oceania DX Contest (SSB)	(Sep 93)
Oct 3	RSGB 21/28 MHz Contest (SSB)	(Sep 93)
Oct 9/10	VK/ZL/Oceania DX Contest (CW)	(Sep 93)
Oct 9/10	Iberoamericano Contest (SSB)	(Sep 93)
Oct 13/14	YLRL Anniversary Party (CW)	(Sep 93)
Oct 16/17	Worked All Germany Contest (Mixed)	(Sep 93)
Oct 17	RSGB 21/28 MHz Contest (CW)	(Sep 93)
Oct 23/24	CQ WW DX Contest (Phone)	(Sep 93)
Oct 27/28	YLRL Anniversary Party (SSB)	(Sep 93)
Nov 1/7	HA-QRP 80 m CW Contest	
Nov 13	ALARA Contest (Mixed)	
Nov 13/14	WAE RTTY DX Contest	(Jul 93)
Nov 13/14	OK-DX CW Contest	
Nov 13/14	ARRL International EME Competition	
Nov 27/28	CQ World-Wide CW DX Contest	(Sep 93)
Dec 4/5	ARRL 160 m Contest	
Dec 11/12	ARRL 10 m Contest	
Dec 31	ARRL Straight Key Night	

Finishing off this column at 2 am, and starting to feel like a sleepwalking robot, puts me in mind of those late night contests where one wakes up to find that one has been calling, or possibly working, stations whilst 99% asleep. The worst thing is not knowing whether the station whose callsign you are sending is one you want to work, have just worked, or are supposed to send a number to. How embarrassing! How confusing to the poor DX station! It's alright for the big guns, whose high QSO rates no doubt provide the stimulus to stay awake, but for us lesser mortals for whom a 2 am dogpile consists of working a JA or W6 every 5 minutes or so, the urge to fall asleep can be overwhelming. Who ever devised this crazy hobby?

I'll spare you further philosophy (mainly because I want to go to bed), and launch straight into this month's contest news. Many thanks to the following for their help, information, and inspiration: VK2PS, VK2SRM, VK3DMS, ZL1AAS, OK2FD, CQ, QST, and Radio Communications. Please keep the letters coming, including any spare copies of rules or results. Until next month, good contesting!

73, Peter VK3APN

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in April AR.

HA-QRP 80 m CW Contest

November 1 to 7

This international contest takes place each year from 0000 z November 1st to 2400 z November 7th, and is open to stations running **up to 10 W input power.** Use 3560-3600 kHz, CW only. Call "CQ TEST QRP", and exchange RST, OTH, and names. Score 1 point per QSO with own country, and 2 points per QSO with EU and DX. Stations can be contacted only once during the contest for points credit. The final score equals QSO points times DXCC countries worked. Logs must show date/time (to the nearest minute), callsign, reports, and QTH and name of operator worked. Summary sheet must include first name and QTH sent during the contest, TX input power, and TX output device. Send logs postmarked by 21 November to: Radiotechnika Szerkesztosege, Budapest, Pf.603, H-1374 Hungary. All entrants will receive participatory certificates, and outstanding scorers will receive a free subscription to Radiotechnika magazine for one year.

ALARA Contest (Mixed)

Saturday November 13, 0001-2359 z

This phone/CW contest is open to amateurs and SWLs throughout the world. YLs work everyone, OMs and Clubs work YLs only. Bands are 80-10 m, and suggested frequencies are 28380-28410, 21380-21410, 21170-21200, 14250-14280, 7070-7100, & 3560-3590 kHz. Each station can be contacted twice per band — once on phone, and once on CW. No lists, nets or crossmode contacts please.

YLs call "CQ ALARA CONTEST" or "CQ TEST ALARA", and OMs call "CQ YL". ALARA members send RS(T) + serial, whether ALARA member, and name. OMs and Club stations send RS(T) + serial, name, and whether Club station. Club station operators **must** identify as a club station each contact, and cannot use personal callsigns whilst operating as a Club member. Score 5 points for each ALARA member QSO, 4 points for each YL non-member QSO, and 3 points for each OM or Club station QSO. On CW, if either operator is a Novice, score double points. SWLs score 5 points per ALARA member logged, and 4 points per YL non-member logged.

Logs should show date/time UTC, band, mode, callsign worked, RS(T)/serial sent and received, name of operator worked, status of the station worked (YL ALARA, YL non-member, or Club), and points. Attach a cover sheet showing all standard information and send to: "Mrs Marilyn Syme VK3DMS, Box 91, Irymple 3498, Vic., Australia" to be received by 31 December 1993.

The Florence McKenzie CW Trophy will be awarded to the highest scoring VK YL novice (minimum 50 points). Because of its size and weight, the actual trophy will not be forwarded, and instead a certificate bearing a photo of the trophy will be sent to the winner. Trophies will also be awarded to the top scoring Australian and DX YLs. A comprehensive range of certificates will also be awarded.

OK-DX CW Contest

1200 z Sat November 13 to 1200 z Sun November 14

This CW contest occurs in the second full weekend in November each year. Bands 160-10 m. Categories are: Single operator, single and multiband; multioperator, single and multi TX; QRP, single and multiband (max 5 W out); and SWL. Single operator stations operate max 20 hours, with minimum 1 hour rest periods. Multiband stations apply "10 minute band change rule" (multi TX stations exempt).

Send RST plus serial; OK stations will send RST plus 3 letter district code. DX (VK) stations score 10 points per OK/OL/OM QSO, and 1 point per QSO with another country. Multipliers are the sum of DXCC countries and OK districts on each band; final score is QSO points (all bands) times multiplier from all bands.

Note rest periods in the log, and use a separate log for each band. Cross-check sheets are required for 200+ QSOs. Logs can also be submitted in ASCII on DOS disk. Entries should be postmarked by 15th December, and sent to: "CSRK, Box 69, 113 27 Praha 1, Czech Republic".

Results of 1992 Barcelona Olympic Games HF Contest

Band	QSOs	Points	Zones	Prefixes	Score
VK4TT	14 80	230	14	42	12880
VK4XA	A 60	248	21	40	15128

Results of 1992 CQ WW RTTY Contest

Band/Score/QSOs/Points/Zones/Countries/States & Provinces							
Single operator:							
VK2BEX*	A	96,520	260	760	41	53	33
VK3EBP*	14	24,905	100	293	22	43	20
VK2BQQ	A	14,260	75	215	23	24	21
VK2EG	A	7,625	44	125	21	25	15
Multioperator single TX:							
VK2RT*		151,632	326	972	36	61	59
VK4WIE		71,540	178	511	42	71	27

*Certificate winners

Results of 1992 SAC Contest

VK2APK won the plaque for Oceania in both CW and SSB categories.

QSOs/Mult/Pts/Final Score
(* = certificate)

CW:

VK2APK*	267	89	413	36,757
VK4TT	65	36	65	2,340

SSB:

VK2APK*	193	73	263	19,199
VK4UA	135	80	135	10,800

Results of WIA 1993 Novice Contest

This year's contest attracted 34 entries, with 25 in Section A (Phone), 9 in Section B (CW), and none in Section C (SWL). The Keith Howard VK2AKX Trophy was awarded to VK5MAP, the novice with the highest score in Section A (Phone), and the Clive Burns Memorial Trophy to VK2JSB, the novice with the highest score in Section B (CW).

These perpetual trophies are on permanent display at the Executive Office, and in each case the winner receives a suitably inscribed wall plaque.

Section A Novice winner: VK5MAP
Section A AOCP winner: VK3APC
Section B Novice winner: VK2JSB
Section B AOCP winner: VK3EFO

Section A (Phone):

VK5MAP	882	VK3LBA	120
VK3APC	878	VK6PDJ	66
VK6WJH*	766	VK5QZ	50
VK2LEE**	699	VK6BWI	49
VK4MWK**	644	VK3DYF	42
VK5NYD**	560	VK1JE	41
VK7MGS**	493	VK2VZB	31
VK5AYD*	423	Section B (CW):	
VK3GH*	408	VK2JSB	76
VK5ATU	391	VK2VZB**	74
VK3NAH**	270	VK3EFO	71
VK1MOJ**	263	VK2SPS*	70
VK5PAY	236	VK6AFW	52
VK3JJF	236	VK2CW	50
VK4KJD	213	VK3XB	47
VK1KLB	198	VK2AZR	22
ZL1GQ	152	VK6BWI	10
VK5UE	137		

** Highest aggregate novice score for each state, excluding National winners.
* Special awards.

Comments: Contest participation was well down on last year, which was rather disappointing. Some logs did not comply with the rules, eg providing a summary sheet (refer to General Rules & Definitions, April AR). Finally I would like to thank all participants in the contest and look forward to a better roll-up next year.

73, Ray Milliken VK2SRM
Novice Contest Manager
PO Box 300 Caulfield South VIC 3162
ar

WIA News

Stereo TV Interference to VHF Bands

There is some relief in sight from TV stereo sound channel interference for operators who inhabit the lower end of the 52 and 144 MHz bands.

Interference from the dual-channel (stereo) sound channel transmissions of Channel 0 and Channel 5A stations located around Australia have long been of concern to amateurs who use the lower ends of the six and two metre bands, where much weak signal long distance work takes place.

The sidebands of these sound transmissions "spill" into the lower edge of these bands, interfering with reception, particularly of weak (DX) signals.

Following investigations into the problem through the WIA Federal Technical Advisory Committee (FeTAC), in 1992 the Federal Council requested the then General Manager/Secretary, Bill Roper, to approach the then Department of Transport and Communications to see what could be done.

This was followed up with a letter to the Australian Broadcasting Authority (ABA) in June this year. In August, the ABA's Robert Greeney, Director of Engineering, Planning Division, replied.

Greeney points out that all of the NSW sites mentioned by the WIA have been "phased out of operation", and Channel 0 at Gordonvale in Queensland has ceased operation.

However, the ABA does not have plans to clear Channel 0 and "therefore it is to be regarded it is an integral part of the television broadcasting service bands for the foreseeable future," Greeney says.

On the matter of Channel 5A and two metres, Greeney says, "The removal of Channel 5A at Newcastle will cause some disruption to reception of the ABC services for some viewers, particularly those without VHF receive antennas, however clearance of ABHN5A in the Hunter Valley will happen after a date for the clearance is decided."

He gave no indication of when that decision might be.

Greeney went on to explain that RTQ5A at Toowoomba has permission to continue operation until 1994, despite the station operating oh a UHF channel from nearby Mt Lofty.

He did note that Channel 5A stations at Townsville North and Nambour had both ceased operation and that MTN5A, at Hay in NSW, would be clearing to another channel in late 1994. Aggregation in Tasmania will see TNT5A at Wynyard moving to UHF after April 1994.

Greeney says that clearance of other Channel 5A services around Australia will be considered during the licence area planning investigations going on over the next two and a half years.

The WIA had suggested that services on Channel 5A be relocated to Channel 9A, but Mr Greeney says that there are no plans to do this at present, pointing out that Channel 9A cannot be used for broadcasting services yet. However, it is expected to be available after 1995.

"In addition," Greeney says, "Channels 9A and 12, when they do become available, will be used to replace Band II channels 3, 4 and 5 where appropriate."

He says the ABA will not assign any more broadcasting services on Channel 5A and will clear it eventually, as that part of the band is allocated and required for other services.

Divisional Notes

Forward Bias — News from the VK1 Division

Chris Davis VK1DO

There have been an amazing number of members whom I have spoken to either on the air, face to face, or by phone just lately who have gone out of their way to comment objectively on the excellent content and general interest of AR magazine. While I am personally very pleased to hear such a high level of satisfaction with our member magazine, I hope that members will take the time to go beyond these casual compliments and forward written remarks to the editorial staff.

The role of the editorial staff is often characterised by insufficient objective feedback, too much misdirected complaint from the disgruntled who seem more apt to put pen to paper, and conspicuously absent are enough objective letters indicating obvious satisfaction and identifying the content which has brought acclaim.

To modify an old saying; "Why do the people who say it goes without saying, go without saying it?" Or to work from the other direction; "Why do only the squeaky wheels make the most noise?" To cut the metaphoric nonsense for the moment, how about a brief note along the lines mentioned above? To maintain the exceptional standard of your magazine, positive feedback is vital. Just as vital as the submission of technical articles, historical articles, etc.

After a disappointing turn out for the John Moyle Field day in March of this year, we have taken the initiative and begun stirring up some interest with generous advance notice. This has been positively received with one group well advanced in their preparations for a station at a location never previously used. This is admirable. I hope that their vigour and initiative is infectious upon others. Field operation is an integral part of our hobby and quite frankly, it's easier than ever. Talk to the chaps who took 100 kilo AM transmitters into the field on trailers during the sixties. If you are keen to form a team for a field day and would like assistance in the planning stages, please call out, we would be pleased to give advice and assistance where we can.

This year will be the last year when courses and classes are run under the auspices of Richard VK1RJ and Ted VK1AOP. The number of successful graduates to the on air ranks pays tribute to the meticulous dedication these gentlemen have given to the job. The standard of professionalism will be sadly missed. However, I hope we are able to find sufficient interest from suitably qualified members to fill their shoes for next year?

On the subject of filling positions, etc, now is an excellent time to contemplate standing on next year's committee. Whether you have been licensed for twenty years, or twenty minutes, your input would be invaluable. Each year, our Christmas break and the dreamy weather of January brings us up to the annual general meeting with a blink of the eye. I will be canvassing and lobbying in the next few months, and I am feeling unforgivably ruthless. Why should such a selfish handful have all the fun?

A final reminder of the Canberra Amateur Packet Group's technical symposium to be held this month on Saturday October 30th. The venue is the Southern Cross Primary School in Holt. Further details are available from Gavin Berger VK1EB on 06 258 5390 or Neil Pickford VK1KNP on 06 258 7803 or 06 274 8422.

A trend emerged some years ago for a large number of members to leave the general meetings immediately they ended, and go off to a local coffee shop rather than socialise with the larger population. This astounds me as someone who values the broader social side of our hobby. For a start, the coffee elsewhere is expensive, the service is appalling, and the large egress of members from our meeting room means that the meeting falls apart with undue haste. Also, only a couple of us are left to tidy up!

How about helping to raise the standard of fellowship after meetings, assist with preparation of tea and coffee, and pull up a chair. Breaking off into elitist groups is negative and short sighted. Before long some members will bypass the general meeting and just go to the coffee shop?.

As someone who puts a great deal of effort into organising meeting topics, co-ordinating equipment for meetings, and has spent many years manning the urns and washing up, I find this trend to take what the meeting offers and then to nick off, rather insulting. I doubt that the action is intended maliciously; however, I am very confident that breaking the trend would benefit everyone.

Remember that the November meeting date will take the form of a barbecue down at Weston Park peninsula which is the continuation of Banks Street in Yarralumla. Talk in direction will be available on channel 50, 146.500 MHz. The date for this bring-your-own-everything Xmas event will be Monday November 22nd.

I look forward to seeing you at our October buy and sell, trash and treasure evening being held on Monday, October 25th. Cheers for now.

5/8 Wave — VK5 Notes

Rowland Bruce VK5OU

Apologies to all those readers who suffered withdrawal symptoms as a result of 5/8 Wave not appearing last month. I was on holiday, had my wallet stolen with my list of deadlines in it, and forgot to submit a column.

The August general meeting of the WIA VK5 Division was a buy and sell and Peter Maddern did his usual job of extracting money for junk and also getting the prices for the good stuff. There was some competitive bidding and some "firsts." Craig bought himself a mini ghetto blaster and Andrew VK5EX allowed himself to be pushed beyond the limit and had to wait until some of his gear was sold before he could pay $5.50 for some co-ax, much to the amusement of the unsuccessful bidder, Garry VK5ZK, who was aware of Andrew's financial situation. Thanks Peter, John and Steve for the service you provide on these nights.

A thank you and a congratulation to Ross Dow VK5KF, who notches up his four hundredth relay of the WIA Sunday broadcast about now. Whew! I don't think I've heard that many. Murray VK5ZQ, our BC officer, is having a break from duties at present and we are grateful to Peter VK5TZX for producing the programs from 5th September to 24th October.

Just in case you have missed the corrections which have been put about, the Equipment Supplies Committee telephone number is 08 287 2868. If it is a number you are likely to use, write it down now please. There is one very patient telephone subscriber in Adelaide who has enough of our voices lately. Council has approved the use of the VK5RAD repeater (147.000 MHz) by the Adelaide Hills ARS to run a weekly club net, for a trial period of six months.

Peter Koen has provided me with news of Scout Radio Activities. JOTA weekend, 16th and 17th October, is almost upon us. There are 23 South Australian Scout Leaders who hold call signs and, together with volunteer operators, they should make the Scout voice in this state well heard on those dates. Look out for VK5BPA operating from Naracoorte caves. Also, Scouts will be involved again this year in the Leisure Day in the Park,

which is the previous weekend, and a joint station with the WIA will operate.

Finally this month, a warm welcome (or re-welcome as the case may be,) to WIA ranks to T N Brownlow, F Fish, S Collins and J Bothwell VK5UW. Wish I had forenames to use, rather than initials.

QRM from VK7

Frank Moore VK7ZMF

As it's been some time since there has been news from VK7 in AR we need to go back over last year. One of the main highlights was the Abel Tasman Award. This was an extremely successful contest with over 150 awards issued. There were many field stations operating from the top of mountains and even at the first landing site of Abel Tasman on the actual anniversary. The award was supported by Tourism Tasmania. Tourism Australia will also be helping by allowing us to place information at most of the tourism gateways into VK7 to inform visitors, licensed and otherwise, of repeater frequencies, contact numbers, broadcast times and other activities.

Two members had the honour of Life Membership bestowed upon them. Joe Gelston VK7JG and Ted Beard VK7EB were made life members in recognition of their many years service to the hobby and the WIA.

The major event in the Southern Branch would have to be the lease of the old OTC VIH Hobart radio site on the Queen's Domain as clubrooms. Following the closure of the site as Hobart Radio, the Branch successfully negotiated a long term lease for the site with the Hobart City Council. The rooms are now being developed and meetings so far have been well attended by members and visitors. It looks like the site will be a major camp for JOTA this year. Keep an eye out for a special callsign to commemorate what was almost 80 years of the site operating as Hobart Radio and a "special" dealing with amateur radio on ABC Radio.

The packet system has had a number of changes thanks to some additional support from AAPRA.

The Northern 70 cm voice repeater VK7RAB is tone linked with the 2m repeater VK7RAF, near Hobart.

Targa Tasmania was a major activity for WICEN (Tas) and amateurs from around the state have been complimented on their efficiency. You will be able to read more about this in an article to be published soon in AR.

All of that and more in this 70th year of the WIA in VK7.

ar

Wanted — A Divisional Secretary for VK6

The Western Australian Division of the WIA is looking to appoint a Divisional Secretary and is prepared to offer a small honorarium to a suitable applicant, to be remitted annually.

The following lists the duties expected of the Secretary, who need not necessarily be an amateur:

Custody of the Official Telephone and Answering Machine, taking calls, answering where possible, redirecting others.

Hold the Key and Clear the Official Post Office Box, Box 10 West Perth, WA 6782 on a regular basis, listing all mail, and redirecting where necessary (eg Financial or Membership, etc), sending an acknowledgment slip immediately and (until competent) checking with Councillors before sending replies.

Attendance at two Meetings a month, both the Council and General Meetings, for the purpose of recording the minutes, notifying the Members of both Incoming and Outgoing Mail, etc.

Custody of the Filing Cabinet and keeping the contents in order.

Applications in writing to the President, Mr C A Bastin, together with a short resume, to be received by the last post on Friday, 29th October 1993.

WIA News

Amateur Escape Fees, Fight Spectrum Auctions

In a narrow escape, the ARRL managed to save US amateurs millions of dollars a year in "regulatory fees" on all amateurs licensed in the US proposed in the US government's budget considerations in August.

ARRL President George Wilson III W4DYI said, "The regulator fee issue.....is a great victory, since it would have been an administrative nightmare and would have cost radio amateurs millions of dollars a year."

Wilson pointed out that the fee might have had a negative impact on young people just entering the hobby, right when it is enjoying a resurgence among young people."

"A fee might have been a roadblock to that first licence", he said.

The ARRL also managed to convince the government committee to accept provision of the Emerging Telecommunications Technology Act requiring the "input" of amateurs in future reallocation of radio spectrum that might affect amateurs.

The provision will require the Secretary of Commerce to seek to avoid excessive disruption of existing use of shared Federal/ Amateur Radio frequencies, an issue the League had been fighting to win for more than a year.

"It gives us more leverage as the government moves toward the auction of frequencies for commercial development," said ARRL President George Wilson.

"Now we have a stronger say in how these frequencies will be selected."

The Clinton government is trying to raise $US10 billion (almost $15 billion Australian), in a proposed scheme to auction slabs of the radio spectrum.

As reported in the Australian Financial Review of 10 August, some 340 MHz of spectrum is to be opened for commercial use in the US, particularly for "personal communication services" that employ new "wireless" technologies, including radio (spread spectrum), local area networks for computer systems, pocket telephones, pagers etc.

While management and licensing of the radio spectrum in Australia is moving towards a "market based system" under the newly-established Spectrum Management Agency, such an auction system has not been mooted for Australia.

However, the WIA is keeping a close watch on developments.

How's DX

*Stephen Pall VK2PS**

Now that we have passed the September equinox, one hopes that there will be some improvement in the propagation patterns, and the DX bands will become alive again. As the present solar cycle still declines towards the bottom, a basic amateur station without an amplifier transmitting an SSB signal is very often difficult copy on the other side of the world. However, not everything is lost for those who accept challenges. Have you considered going back to basics? Like going back many years and operating in the CW mode? There is still plenty of good CW DX around on the 20, 30 and 40 metre bands, especially in the afternoon or early in the morning local time.

Here are a few DX prefixes heard lately : 9J2 — ZD8 — YS — PZ — CX2 — FM5 — OA4 — ZA — D68 — YI9 — 9K2 — CN8 — HH — HP — CO — Z31 — 5R8, and of course lots of Europeans, Americans and Japanese. All of them were CW signals.

Yes, I know, some of you are a bit rusty handling CW and there are no "nets" to assist you. But this is the challenge! A little practice with the key can solve your Morse problem and your listening skills and propagation knowledge will overcome the absence of the SSB nets. Remember, also, that a 100 Watt CW transmission is quite a strong signal which will penetrate the QRM and QRN and is useable most times, even in bad conditions. So try a little CW. Good hunting!

Thursday Island — VK4

In the last few months Thursday Island (OC-138) has become the target of the "island chasers". Rex VK4BRE obliges from time to time to appear on the bands, providing he can find time in his daily busy schedule, being the only baker on the island. Thursday Island — and the other surrounding islands — Friday, Hammond, Horn, Prince of Wales, Sunday, Wednesday and Tuesday — lie in Torres Strait about 40 kilometres north of Cape York, the most northerly part of mainland Australia. It has an area of about 2.5 square kilometres and a population of over 2000. The island is the administrative centre of the large island group. It is not certain who named Thursday Island, some believing it to have been Captain Cook, others think it was Lt Phillip Parker King who charted the area in a cutter named "Mermaid" in 1819. European settlement dates back to 1877. Thursday Island with other islands lying within 60 miles of the coast of Queensland was annexed to that colony in 1872.

Recently I received a QSL card from Rex together with some personal details about the life of this most northerly radio amateur in Australia. Rex and his wife Dot, who is a Torres Strait Islander, own and operate the local bakery on Thursday Island and this keeps them very busy. Rex has just upgraded to full call (VK4BRE) and his wife Dot, the only Torres Strait islander to have an amateur licence, is the proud owner of the novice call VK4MME. Their amateur activity is mainly on 2, 15 and 20 metres in the late afternoons or early evenings. They have lived on the island for the past 8 years, arriving in a yacht which they bought in Brisbane and in which they cruised the east coast for seven years. They have four children, aged 5 to 16. Being busy has not stopped both of them from studying for private pilot licences and Rex says that by the time you read these lines he will have passed his final exam. Dot is halfway through her studies. There is no QSL Bureau on Thursday Island so if you require a card from OC-138 send your card with the appropriate reply envelope and return postage to: Rex PO Box 418, Thursday Island, Queensland, 4875, Australia.

160 Metre DX

When Regulation Fifteen of the US Radio Act 1912, shortly after the first World War, had specified that "no private station...shall use a transmitting wavelength exceeding two hundred meters" and when in 1923 the 150 — 220 metre amateur band was created in the US, no one could foresee the rapid development of amateur communications on the short wave bands.

Today, only a very small segment of the medium wave band, which we call the "160 Metre Band", is used by amateurs. Propagation on this band for DX purposes depends very much on the activity of the sun and on the maximum disturbance in the earth's magnetic field as measured by the K Index. It also depends on the time when the sun sets or rises in the respective station locations. Roger VK4YB and Bob VE7BS have conducted propagation experiments on this band for a number of years. Each year during the "southern winter" a small band of 160 metre enthusiasts gather on the 1.832 kHz frequency. Alaska, Canada, the west coast of the US, New Zealand and stations on the east coast of Australia are represented around 1100 UTC.

During the 92 nights of the 1993 "season", which officially ended on the 13th of August, there was a total of 940 check-ins with an average of ten participants per night." *The year has been more difficult than 92 and a lot more difficult than 1991"* Bob wrote in a letter to me. *"Everyone agrees that the best days have been when the K index was high and/or increasing. The best of all has been when a major flare has been spotted but the particles have not yet reached earth. The actual solar flux figure does not seem to matter much"* says Bob.

Transmitting power is not of very great importance. Many VKs made the trip across the Pacific with 100 watts. However, antennas are of great significance and activity in this field gives the average amateur ample room for experimenting with "wires".

Peter I Island — 3Y1

As reported earlier (June 1993 AR) this expedition is still on track for a 16 day operation commencing on the 1st of February 1994. Ten operators will be running four stations on all modes. A deposit payment has been made on the ship. The team leader is Ralph K0IR and they are still looking for one more experienced operator. Donations are very much welcome and should be sent to AA6BB who is also the QSL manager to the group together with KA6V.

Canton Island — T31

Canton Island is in the news again. I reported in October 1992 in AR that some development is planned in the near future on this small coral island in the Pacific. Lately it has been reported that Tek T32LN will be visiting the island several times during the next year. A fishing resort is under construction on Canton Island and it is planned to be open around September 1994. The resort will be managed by Tek T32LN. It is then hoped that DX activity will be more frequent from that island in the distant future. Intending DXers should contemplate using the existing facilities already there. There are two huge log periodic antennas on the island, one facing west the other facing east. Both antennas are located on 150 feet tall towers. The coax leading to the antennas is three inches thick! New electronic installations? No! These antennas and towers are the leftovers of the 1960 NASA re-activation of the island. They are still in good condition. However, if you are in a hurry and do not wish to use the boat service from Tarawa which has an unpredictable time-table, then the only way to Canton Island is by chartering

an aircraft from Samoa which will set you back by US$5000. Each day for the plane overstay will add a further $1000 to the cost.

Christmas Island — VK9X

Steve VK6VZ advised me that he will be on Christmas Island for a week starting November 6th. He will be on holidays but will try to be active on 20 and 40 metres on both CW and SSB. Time permitting he will visit the Southern Cross and Butterfly nets (14226.5 kHz). QSL direct only to his home call.

Yemen — 4W

It was reported in several DX publications that the planned Yemeni DX expedition will not proceed for the time being. UA4WAE says, quoting KK6H one of the operators who had been scheduled to go on the trip, that the Republic of Yemen will not issue a licence or operating permission to a DX group which includes Americans.

Romeo — 5A0RR

Finally news of Romeo. Here are some of the details of a lengthy news release from Romeo, as received by Ed NT2X and as it appeared on the OPDX/BARF 80 BBS Bulletin in Cleveland, Ohio on August 23rd. Originally Romeo planned a Libyan operation of six operators, but due to lack of funding, only Romeo, Danny LZ2UU and Said (a Libyan who currently holds the callsign 5A0RR) participated in the five days operation, during which they worked 11000 stations. The DXpedition coincided with the International Arab Summit held at that time in Cairo and national security in the region was at a very high level. The expedition was terminated when Romeo and Danny were accused of planning to assassinate President Mubarak of Egypt and President Gaddafi of Libya. They were also accused of using ham radio to cover illegal drug trafficking.

They both ended up in a Libyan jail, and Romeo does not go into details on this subject, except to say that he is now in Moscow under medical care and treatment. The Libyan operator, Said, will continue to operate under the callsign 5A0RR — Romeo left the equipment behind. Said is an excellent CW operator. Copies of the 5A0RR logs are in Bulgaria and QSLs are being sent. Romeo was greatly disturbed about the unwarranted and undeserved criticism about himself, along with false charges, and at the small support he received from the ham community during his ordeal. QSLs to be sent to his well known Bulgarian address, Box 812, Sofia 1000.

Future DX Activity

- Penrhyn Island in the North Cook group is very active. Husband and wife team, Hugh and Aimee, are active as ZK1DT and as ZK1AT and are heard often on the 14247 "net". QSL to Hugh and Aimee Tabique, Penrhyn, North Cook Islands via New Zealand.
- Michael C56/AA7NO, Warren C56/KF7AY and Tony C56/N7BG will operate from Banjul, Gambia before and after the CQ WW SSB contest at the end of October. QSL to home call of each operator.
- The contest station C56V will be heard on Oct 30-31. QSL to KD7E.
- Iran will be active during the whole of October. EX0A/EP, EX0M/EP and 9D8UW will be active, one hopes. At the moment they are still looking for sponsors.
- XX9AS can be heard often on 21177 kHz at 1300 UTC.
- HL93 is a special prefix in celebration of the Taejon International Exposition in Korea. The special EXPO station callsign is 6K93XPO.
- Crozet Island, FT4WD, can be heard on 18 MHz, mostly on weekends. QSL to F6AXX.
- Expect to hear WA4FGY active under the call HS0ZBJ. He is taking up residence in Thailand for an unspecified period.

Interesting QSOs and QSL Information

- 5B4YY — Jeff — 14247 — SSB — 0424 — July — QSL to G4KIB to J L Hambleton, 3 Aldery Close, Glen Parva, Leicester, Leics, LE2 9HY UK.
- D2SA — Chris — 14198 — SSB — 0631 — July — QSL to F6FNU to Antoine Baldeck, Box 14, F-91291, Arpajon, Cedex, France.
- ET3DX — Franz — 14197 — SSB — 0450 — Aug — QSL to JH1AJT to Yasuo Miyazawa, PO Box 8, Asahi-Ku Yokohama 241 Japan.
- T30W — Willy — 21205 — SSB — 0513 — Aug — QSL to AA6BB to Gerald D Branson, 93787 Dorsey Lane, Junction City, OR 97448 USA.
- HH2Z — Jan — 21205 — SSB — 0549 — Aug — QSL to KA9RLJ to Gary F Olson, 1915 10th St, Peru, IL 61354 USA.
- V31ML — Mike — 14243 — SSB — 0430 — Aug — QSL to N5FTR to William M Loeschman, 717 Milton, Angleton, TX 77515 USA.
- VP2M/KM6WF — 14250 — SSB — 0442 — July — QSL to KM6WF to Gayle Olson, 11216 F, Dorland St, Whittier, CA 90606 USA.
- ZA1N — Spiro — 14250 — SSB — 0520 — Aug — QSL to HB9BGN to Albert Muller, im Hubacker, CH — 8311, Bruetten, Switzerland.
- EX0A (formerly UM8) — 14228 — SSB — 0200 — Aug — QSL to DF8WS to Wilhelm Schommer, Merscheidetrweg 37, D-5522, Speicher, Germany.

From Here and There and Everywhere

- Do you remember Bing VK2BCH who, some years ago, gave you Rotuma Island as a new DX country? Bing in the past was active under these callsigns: VK9LB — ZK1XV — 5W1GY — ZK3RVC — 3D2XV — and A35XV. One does not hear much of Bing these days. The truth is that Bing was very sick over the past 12 months and he is now recovering slowly. When last on Rotuma he picked up a parasite infection and a fever which he found very difficult to shake off. He is *"feeling much better just lately and I hope to take a trip to Lord Howe Island from the 18th of September to the 18th of October".* The call will be VK9LB and QSL direct only to the VK2BCH call book address.
- Bill K1SE advised me that he is the QSL Manager for Bob J28BM, Steve VK8SD (his son), and Bill A45ZW in Muscat, who likes to operate RTTY. K1SE just acquired a post office box to handle the QSL cards and he prefers that cards should be sent to the box address: Bill DeLage, PO Box 685, Manassas Park, Virginia, 22111 — 0685, USA.
- Mexican Novice operators are using the XE0 prefix. They are allowed to operate CW from 7000 to 7050 kHz, and LSB from 7050 to 7100 kHz.
- Willy (formerly T30AC) is back in Kiribati with the new callsign T30W.
- Belgian amateurs were using the special prefix of "OO" until the end of September celebrating the accession to the throne of their new King, Albert II.
- Monk Apollo, SV2SAP/A from Mt Athos, was heard on the European DX net talking to Selim, OE6EEG in Greek. The signal was quite strong here in VK. However, he did not respond to any other outside calls.
- Henry T30A (formerly — T30BC) is a silent key as from the 24th of July.
- Richard ZK1XR is on Manihiki Atoll in the North Cook island group making a documentary film. He has electric power only for four hours each night starting from 0500 UTC. Send cards to his home call N7NKG.
- The Spratly Island activity, 9M0S, has been accepted by the ARRL for DXCC credit.

- According to I0IJ and reported in various DX Bulletins, no amateur activity is planned for the SM0M (Sovereign Military Order of Malta) station, with the callsign IA0KM.
- The DXCC backlog at the end of July was 114 applications (16345 QSL cards). Turnaround of the cards is only a few weeks.
- All new applicants for amateur licences in Hong Kong are issued with the VR2 prefix. Old VS6 licences are converted to VR2 upon renewal.
- Peter ZK1XP on North Cook has appointed Jim Smith VK9NS as his QSL Manager.
- It was reported that the well known Finnish DXer, Martti Lane OH2BH will be moving to Hong Kong for the next two years because of business commitments. It is expected that from time to time he will operate for short periods from BV, BY, VS6/VR2, DU, HL, and maybe from P5.
- Nothing further to report on the proposed Pratas Island activity. Some sources say that the hopeful operators are waiting on some action by the Ministry of Communication, others say that the callsign will be BV0ARL/BV9P. Again some weather experts are pointing out that September to November is the typical typhoon season in the South China Sea. An unconfirmed source is suggesting that the operation will be active from 6th October, when a major European operator joins the group. Could it be the well known ....?

QSLs Received

ZL7AA (4M ZL2TT) — J28BM (1M K1SE) — 5X1DX (3M NY3Y) — EP2MHB (4M op) — C91J (8W W8GIO) — 9G1AA (4M PA2FAS).

Thank You

Thanks to all of you who have kept me informed, especially to: VK2BCH — VK2KFU — VK4BRE — VK4YB — VK6VZ — K1SE — VE7BS, and the following publications: QRZ DX, The DX Bulletin and the DX News Sheet.

Good DX and 73.

PO Box 93 Dural NSW 2158

ar

Repeaters — Additions, Deletions, Alterations. Have you advised the WIA of changes needed to the repeater list?

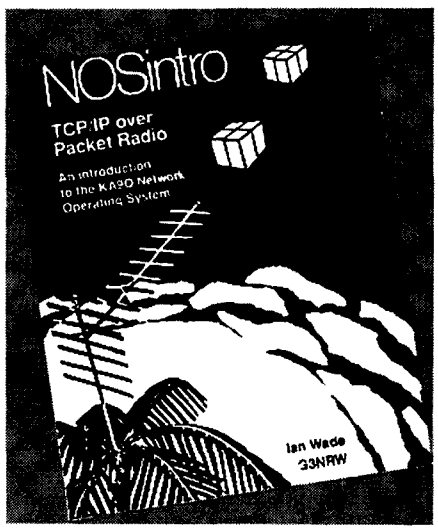
A Packet of Packet

*Warren Toomey VK1XWT**

Well, I'm back after a month's break, caused mainly by work-related activities. Please note my new address. I've had some lost mail troubles recently, caused mainly by an unlocked letterbox and a nearby primary school; hopefully the new address should fix this.

This month's column has another book review, this time of an introductory book about the NOS program, which provides a rich set of applications and protocols for the amateur packet user. My thanks to Marek VK1MK for the loan of his book, and to Jeremy VK1CIA for the review. This is followed up by a pet "dislike" of mine and something that is related to packet radio: why "Baud" does not mean "bits per second".

Overview of NOSintro



NOSintro is a 350 page, soft cover training and resource guide for the packet user interested in the world of TCP/IP and the applications that run on top of it. NOSintro is reasonably up to date (having been published in 1992) and is full of examples, explanations and reasoning for most of the features within NOS. It is based on the PA0GRI 2.0 NOS implementation, and also describes a suite of programs called NOSview which provides on-line help when running NOS.

The book is made up of 35 chapters and investigates most of the basic requirements for a user to configure a NOS packet station. Many of the examples are identical to those required to configure a home system. For the new user this book will provide the essential knowledge required to progress and reduce the requirement to ask simple questions of other users. This training combined with the reference sections will increase the reader's knowledge at a faster rate than without it.

For the expert user the book still has many uses as a reference manual. Even the most knowledgeable NOS user will still learn a lot about NOS with it, even if it is only to find out a simple way of answering a question about NOS that another user has asked.

As a reference book, NOSintro is a excellent guide to operations and capabilities. Tuning and adjustments are all described and their effects identified for the user. The examples are excellent and the numerous diagrams increase the learning speed of what can be a difficult area of understanding.

The book is not restricted to TCP/IP and investigates most of the other protocols used in packet today. There are reviews of AX25, NET/ROM, SMTP, POPmail, and many other protocols and applications.

Many of the features of NOS are based on the Unix environment, to a larger degree than DOS. Features like FTP, Telnet, Ping and Mail are important services to the user and are introduced to the reader with a good degree of background and flexibility.

If the reader is new to the area, I suggest a quick read of the entire book to start, and then an attempt at all of the exercises. With this under the belt, a second and more thorough read of NOSintro will be invaluable.

The book is a highly recommended training guide to all packet users who want to try out NOS, or who are already well versed in it. In fact, I would suggest that NOSintro is essential reading. Without it you will require a larger amount of time to pick up the concepts, and may need a lot of assistance from other users. It is possible to bring up a NOS station by following the book and not requiring external assistance.

The only real problem with the book is that there are so many flavours of NOS available, and the local NOS community may prefer another flavour. I would recommend that a new user use the version described in the book (PA0GRI 2.0m) for initial investigation, and then change to the preferred local flavour when the user is confident with NOS. However, the book's contents are at least 90% applicable to all flavours of NOS, and it is still an excellent resource for all NOS users and should be on all packet users' desks.

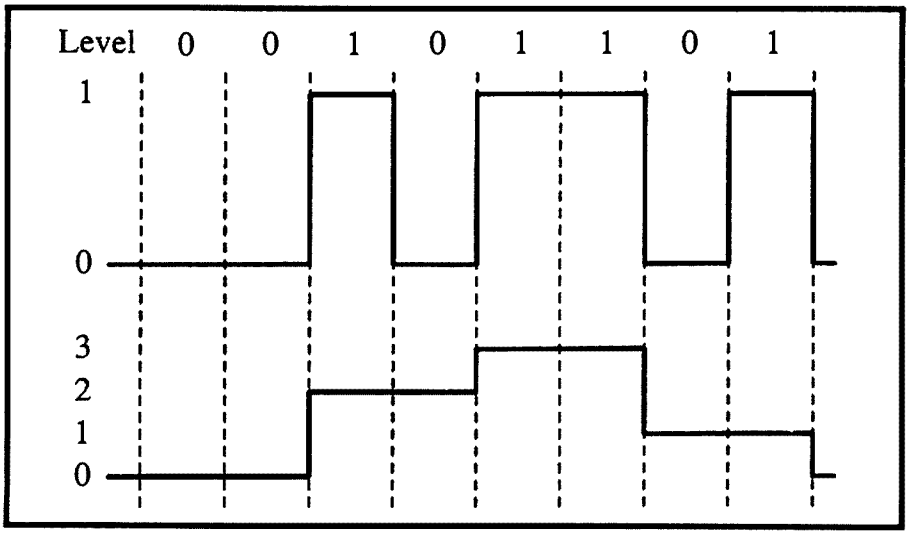


Fig 1 — Data transmission — multiple levels.

The book is probably the best introduction any user could have to the complex world of advanced data communications. I highly recommend you buy the book and enjoy the new world of TCP/IP amateur packet radio.

NOSintro is available in Australia through the Australia Amateur Packet Radio Association (AAPRA). For more details, send a letter to:
AAPRA, 59 Westbrook Avenue, Wahroonga NSW 2076.

To Baud or Not to Baud

We are used to hearing the speed of modems and such being described in terms of "Baud', eg 300 Baud, 1200 Baud, 9600 Baud, but exactly what does it mean? Most people, I suspect, would say that a 300 Baud modem can transmit data at 300 bits per second -- in other words, that "Baud" is a measure of the modem's bit rate.

Unfortunately, "Baud" is exactly the wrong word to describe the bit rate of a modem. So why do we use it then?
I'm glad you asked (after all, this column would have been much shorter if you hadn't)! Well, back in the early days of digital communication, Emile Baudot designed a teletype system where characters are sent as groups of 5 bits over some medium (radio, landline), known now as the Baudot system or RTTY. To transmit a character, each of the five bits is transmitted in turn, with the transmitter sending a certain signal (a certain voltage or a certain sine wave frequency) if the bit is a "1', and another if the bit is a "0'. Purists please note that I'm ignoring the start/stop bits for simplicity.

The Baudot system uses two signal levels to transmit its data, and the signal changes when the bits change. The term "Baud" was thus coined to describe the rate at which the **signal** changes, in changes per second. So a Baudot transmission at 50 bits per second is being sent at 50 Baud. Now the Baud rate is useful because it relates to the bandwidth needed to send a transmission: a transmission at B Baud needs at least B/2 Hz of bandwidth. Our 50 Baud transmission needs at least 25 Hz of bandwidth to be sent.

We now have:
Bit rate: The rate at which bits are being transmitted, measured in bits per second.

Signal rate: The rate at which the signal changes, in changes per second or Baud.

But if these are the same, what's the problem?

The problem is that the bit rate and the signal rate are *not always* the same. I've shown that the signal rate indicates the bandwidth needed for transmission. In many situations the bandwidth is limited, and this limits the rate at which the signal can be changed, and in turn the bit rate. For example, a standard "phone line has a bandwidth of around 3100 Hz, which limits the signal rate to 6200 Baud in one direction, or 3100 Baud in both (ie full duplex). If there was a way to send more bits for each signal change, we could increase the bit rate without using more bandwidth.

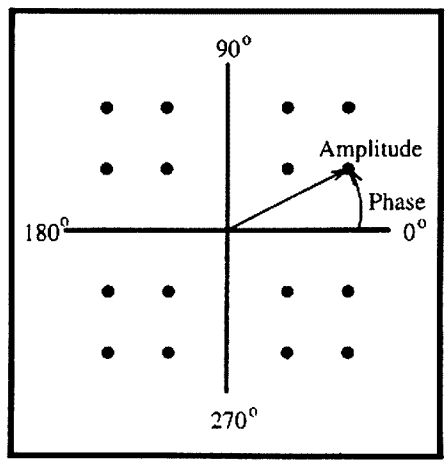


Fig 2 — Amplitude/Phase pairs in V.32.

Fortunately, this is easily done. Instead of using the two-level method as with Baudot, we use more levels to encode more bits. For example, if there are four levels of transmission, we can send two bits for every signal change. Alternatively, eight levels would allow us to send three bits for every signal change: three bits of information can have 2^3 or 8 values, corresponding nicely to our eight levels.

An example is shown in Figure 1, where we are sending the bits "00101101'. In a two-level system, each level represents one bit. In the four-level system, each level represents two bits. You can see that the signal only changes half as often in the four-level system, so that if both transmissions were at 1200 bits per second, the top one would be at 1200 Baud and the one below at 600 Baud, thus needing half the bandwidth.

This is exactly the sort of technique used by V.32 9600 "Baud" 'phone modems, which transmit at 9600 bits per second in both directions, and thus would need at least 9600 Hz of bandwidth with a two-level system. A "phone line only provides 3100 Hz of bandwidth, so a sixteen-level system is used. This encodes four bits at a time, which brings the Baud rate in each direction down to 9600/4 = 2400 Baud. Each direction needs 1200 Hz of bandwidth, giving 2400 Hz required overall, which fits into the 3100 Hz provided by the "phone line. A 9600 "Baud" modem, then, is actually a 9600 bps modem, and a 2400 Baud modem.

How each of the levels used are transmitted depends on what method is used to connect the two ends. If a direct connection is used, 16 voltage levels could be used. Over a "phone line, some form of frequency, amplitude or phase modulation can be used. In fact, combinations of these modulation techniques can be used. For example, the V.32 9600 bps(!) modems use a combination of amplitude and phase modulation, with a particular amplitude/phase pair of the signal (ie the audio frequency carrier) to represent each of the sixteen levels, as shown in Figure 2.

So, to conclude, a Baud rate describes the rate at which a signal changes (and implicitly its bandwidth), and is not always related to the data rate in bits per second.

See you all again in the next column!

*PO Box 179, Lyneham ACT 2602
VK1XWT@VK1KCM.ACT.AUS.OC
vk1xwt@minnie.vk1xwt.ampr.org
ar

Pounding Brass

*Stephen P Smith VK2SPS**

Samuel Finley Breese Morse (1791-1872) was born in Charlestown, Massachusetts, the first child to Calvinist Minister Jedidiah Morse and his wife Elizabeth. Samuel had two brothers Sydney Edwards and Richard Gary, born some years later.

Samuel Morse invented the telegraph, taking advantage of the findings of other experimenters, notably Joseph Henry, who developed the electromagnet. A moderately successful portrait painter and sculpturer, he won the prized gold medal from the "Adelphi Society of Arts" for his sculpture of the "Dying Hercules". Some of his more famous paintings included Congress Hall, otherwise known as the Old House of Representatives, The Louvre and the Lafayette portrait which hangs in New York City Hall.

Morse became interested in the concept of the telegraph in 1832 while returning from Europe to America. While he was away from home some years earlier, his first wife Lucretia Pickering Walker died at the age of 25 and it took two weeks for the news to reach him. In the course of a conversation on electricity and electromagnetism with Dr Charles Jackson, on board the packet "SULLY", he conceived the idea of the electric telegraph and said he saw "no reason why intelligence might not be instantaneously transmitted by electricity to any distance".

In 1836 Morse built his first working model, a crude machine fashioned from a picture frame, a printer's point rule and wooden clock parts. The transmitting device consisted of a long, thin, wooden tray called a point rule, which contained notched metal pieces. This was drawn under a set of electrical contacts and, as it moved, would cause the contacts to open and close, thereby alternately opening and completing an electrical circuit.

At the other end of 1700 feet of wire was the receiving unit. It recorded the dot dash type message that was notched in the point rule by writing marks with a pen on to a strip of moving paper. The movement of the pen was controlled by an electromagnet that responded to the electrical impulses passed through the wire, while the paper tape was drawn by a clock mechanism.

Morse used a code book at the transmitting and receiving end. Various codes were used to indicate certain words, names, dates and so on. Although this device operated successfully, it had drawbacks.

Alfred Vail became interested in Morse's experiments and was accepted as a 2/16th partner. Vail's family owned the Speedwell Iron Works in Morristown, NJ and it was there that the receiving register and simple hand key were developed to replace Morse's first instruments. Vail also aided substantially in developing Morse's letter code of short and long pulses, or "dots and dashes" which was used in an 1838 demonstration to interested friends and supporters. This code was modified and improved for demonstration to Congress in 1844, and with only minor changes was used in US, Canadian and Mexican landlines until the demise of commercial and railroad telegraphy.

In 1843 Morse obtained a $30,000 grant from Congress to prepare a demonstration telegraph circuit. After much difficulty, a circuit was established between the Supreme Court chamber of the Capitol building in Washington and the Baltimore & Ohio Railroad station in Baltimore. On May 24, 1844, Morse and Vail successfully demonstrated the practicality of the invention. Morse had promised Miss Annie Ellsworth, daughter of the patent commissioner (who was a friend of Morse), that if he obtained the grant for the experiment, she would have the honour of composing the first message. She did so, selecting from the Bible, Numbers 23:23 "What Hath God Wrought."

Later that same year, the usefulness of the telegraph was shown when the Democratic National Convention, held at Baltimore, nominated James K Polk for President and the news was flashed to Washington. Very soon newspapers began to include columns of "telegraph news" in their publications.

Associated Press was the first news gathering organisation to lease a private wire from the telegraph company and United Press, International News Service and other wire services followed.

The telegraph receiving register had a moving strip of paper on which short or long marks (dots and dashes) were made by a pen attached to the armature of an electromagnet. The operator transcribed these marks into a written message. Very early, perhaps 1846, operators discovered they could discern letters and numbers from the sounds made by the register. A young man named James Francis Leonard is generally credited with this discovery. Writing messages from the sounds instead of transcribing from the tape was at first opposed by telegraph company management (Morse always insisted on calling his invention "the electromagnetic printing telegraph", but it soon became widespread and "sounders" were manufactured beginning in 1856.

Learning to telegraph is not as difficult as it might seem. Just as we learn the shape of letters and numbers in learning to read, telegraphers learn their sounds. Once the alphabet is memorised it only remains to increase speed so that entire words, instead of letters, are heard.

Best wishes, Steve VK2SPS.

**PO Box 361 Mona Vale NSW 2103*

ar

REPEATER LINK

*Will McGhie VK6UU**

Pagers

Since I last commented about our problems with pagers, little has changed, except that the problem has become worse. More higher powered pagers are going into service every day. It is difficult to find out the effects of pagers on the other side of the continent (the east coast) but, if it is anything like over here in VK6, then the effect is big. Yet another repeater in VK6 is being flattened by a new pager or pagers. The latest to be rendered near useless is VK6RHW some 100 km east of Perth. This repeater is being keyed every 20 or so seconds. The problem is so bad that the repeater is remotely turned off for most of the time. Fixing these problems can be very difficult and time consuming.

The first problem the repeater manager is faced with is to identify the exact nature of the interference. Most likely it is strong signal overload of the repeater receiver. However, the possibility that it may be spurious radiation or mixing between two or more pagers from the pager site, cannot be ruled out. To identify the true nature of the pager interference can take a lot of time.

Most repeaters are a considerable distance from the home of the repeater manager, so finding time to visit the site to work on the pager problem often delays finding a solution. Once on site, about all that can be done initially is install a number of cavity filters in the repeater's receiver to see if the pager interference is eliminated. If this works it is receiver overload and a front end cavity filter or two will fix the problem.

If the addition of cavity filters does not remove the pager interference, then all sorts of options now have to be tried.

None of these options is easy with limited equipment and money. Perhaps the next best option is a very loosely coupled cavity filter or two. The reason is that even two or three normal cavity filters may not be enough to remove the pager signal, which may only be 100 kHz away from your repeater receiver's frequency. At this frequency spacing a normally coupled cavity filter offers only about 2 dB of attenuation to the pager signal. At 500 kHz separation between repeater receiver and pager transmitter about 10 dB of attenuation is normal. With a very loosely coupled cavity filter the Q goes up considerably, and as a result the attenuation of the pager signal.

The accompanying diagram (Fig 1) shows the frequency response of a full size 100 mm (4") diameter cavity filter with very light coupling. Also shown for comparison is a normally coupled cavity filter. The coupling loops are reduced in size, or moved away from the centre tuning element, until 8 dB of insertion loss is produced on the centre pass frequency. Now that is a lot of loss on the frequency that the cavity filter is supposed to pass with almost no attenuation. But, as I have already stated, a normal cavity filter often is just not sharp enough to have any effect on a strong pager signal.

The accompanying drawing shows the dramatic effect of reducing the coupling to the centre tuning element. Now instead of only 10 dB attenuation at 500 kHz, almost 20 dB of attenuation is produced. More importantly the close-in attenuation has increased dramatically from 2 dB to 10 dB for a pager only 200 kHz away. The sacrifice is a greatly increased loss on the desired pass frequency. For use in a repeater, 8 dB of loss in the receiver sensitivity is just not on. However, as a means of localising the pager interference to your repeater, this loosely coupled filter can be very useful. Two of these filters in series produce twice the attenuation. If, after placing two of these cavity filters in series in your repeater receiver, there is still pager interference, then the indications are that it is not your repeater's receiver. Eliminating where the problem is not can reduce the enormity of the problem.

While investigating the frequency response of 8 dB loss cavity filters some interesting things were noticed. Reducing the coupling resulted in less selectivity. This can be explained because there must be a point where further reducing the coupling effectively means no coupling. The filter ceases to be in circuit and has little effect. 8 dB of pass attenuation was about the highest Q; beyond this point the Q went down and the band pass flattened out. Also noticed was the non-symmetrical nature of the response. This is because of the anti-resonant point of the cavity filter is above the centre pass frequency. At this anti-resonant point the attenuation becomes very high, typically 70 dB in a VHF cavity filter. This anti-resonant (parallel resonant) point is typically about 4 MHz higher than the pass frequency. Beyond this anti-resonant frequency the attenuation reduces. The anti-resonant point produces a very deep sharp notch. This notch can be shifted by the addition of an inductor across the in/out ports to bring it closer to the pass frequency. More about this in a further edition of Repeater Link.

The use of a loosely coupled cavity filter is not restricted to a test set up. By placing a low gain pre-amp before the cavity filter, the loss in the filter can be overcome. A 10 dB pre-amp makes up for the cavity filter loss and the original sensitivity of the repeater receiver is restored. This set up was used at a repeater site in VK6 to cure pager intermod in the repeater receiver. Receiver overload usually doesn't occur in the RF amp but in the first mixer. Provided the RF pre-amp only replaces the loss in signal strength due to the cavity filter, then pager overload can be eliminated from a repeater receiver. The very high Q of a loosely coupled cavity filter or two coupled with a low gain RF pre-amp may fix your pager problem in your repeater receiver. Such a pre-amp could be a grounded gate FET design using a U310.

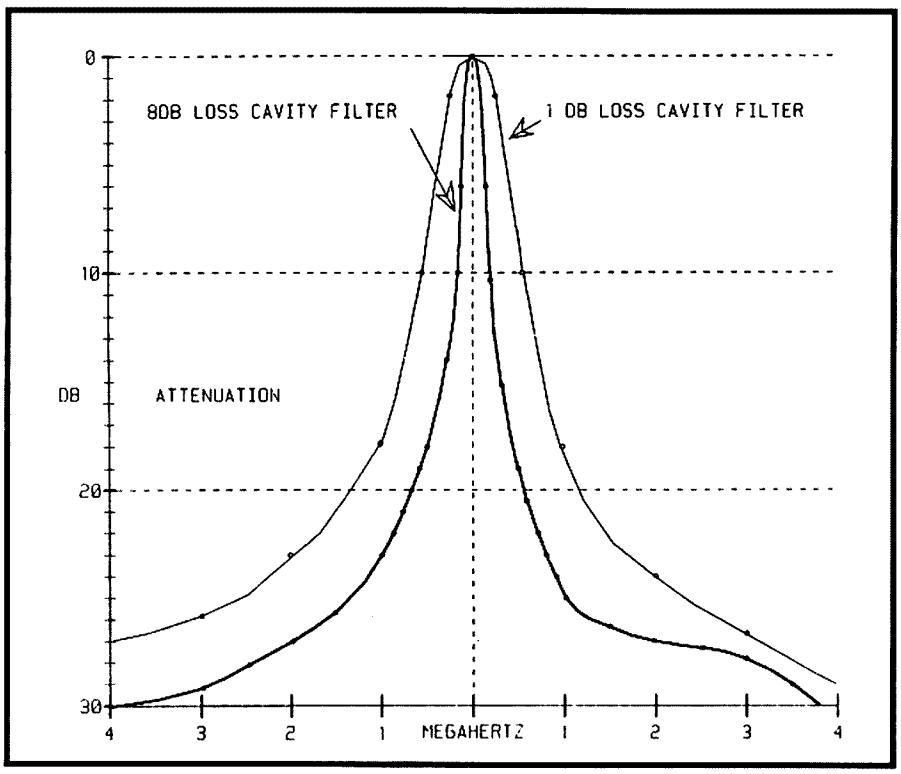


Fig 1 — The frequency response of a full size 100 mm (4") diameter cavity filter with very light coupling.

Pager Speculation

The more I hear about the problems pagers are causing in Australia to amateur repeaters, the more I'm concerned and mystified. How widespread pager interference to our repeater network is can only be guessed at. Is it a big problem or not? Amateurs often operate repeaters in isolation with little or no contact with any other repeater managers. Sometimes problems caused by pagers to a particular repeater continue unreported to other amateurs or the WIA. One such example came to me from VK2. The level of interference and effort put in by the repeater manager were on a scale not yet seen in VK6. The pager interference was a rare (I hope) situation where the problem was not in the amateur repeater, but a combination of pagers mixing in each other's transmitters, and re-radiating an actual signal on an amateur frequency close to a repeater input. The worrying thing about this situation is, that even though every one from Telecom to DOTC to the amateurs involved cooperated in trying to fix a difficult problem, could it just become too hard and too expensive in the future?

Not being one to spread doom and gloom, particularly as the facts on just how bad or not the pager problem is to our repeater network are not yet clear, I'm

hesitant to add speculation about the future. However, that said, times are changing very fast in the communication field. Now that competition is alive and well, can we expect that large amounts of money will be spent to fix up pager problems to our repeater network, even if it is the pagers that are at fault. How, I hear you ask, could pagers be at fault after I have told you so often that it is usually the repeater receiver. Here is a possible example.

Say a pager company installs two or more pager transmitters on the same site. Due to a poor technical choice of frequencies and antenna placement there is a resulting mixing and re-radiation of pager signals on to our 2 metre band. This initially went undetected or unidentified. This type of multi frequency pager installation is repeated on several sites over a considerable area. Even though pager problems were experienced by repeaters in the pager area, the first thought was to blame the repeater receiver rather than pager radiation into our 2 metre band. By the time the true situation was identified, the cost of solving the problem had become considerable. Even though we are in the right to expect the pager company to fix the problem, and efforts were made to remedy the situation, what happens if it is too expensive? Can we expect relatively large amounts of time and money to be spent on fixing a problem that only affects a very small number, perhaps as low as 10? At the political level how would this situation be seen, because this is where it could well end up? In the current commercial struggle between the pager companies, is a political decision likely to be to spend 10's or 100's of thousands of dollars to make a dozen people happy? In particular, people who are on the fringe when it comes to being understood by the majority and probably the politicians as well.

It could all remain hypothetical and never be a problem to the amateur. The pager problem may only be a minor problem and in time technical solutions refined so that our 2 metre band coexists with the pager. The real problem is in finding out just what is happening. Are pagers a big or little problem to amateur repeaters on 2 metres?

To give you some idea of how hard it is to find out information about amateur repeaters in VK6, WARG (The West Australian Repeater Group) sent out letters to all repeater license holders as listed in the call book requesting basic information about their repeater. WARG coordinates repeater management in VK6 on behalf of the WIA and wanted simple information like location, equipment type and repeater manager. This information could then be used to contact directly those involved in repeaters and keep them up to date on current issues. The response, one reply!

What are the experiences of repeater managers in coexisting with pagers? What percentage of repeaters have been affected by pagers, and of that number, how many have found solutions? Some times the few big noisy problems receive all the attention, when the majority have no problem, but go unreported. If there is a big problem with pagers then all amateurs need to know. As a starting point let me know so I can let other amateurs know. Silence can be taken to mean there is no problem.

21 Waterloo Cr Lesmurdie 6076 VK6UU @VK6BBS

ar

Spotlight On SWLing

Robin L. Harwood VK7RH

Welcome to this month's column. First off, it has been confirmed that Radio St Helena, will be again re-activated this month. Last year this broadcaster, located in the South Atlantic, and perhaps one of the most difficult and rare catches on shortwave, was heard after a long absence. The local station, in co-operation with Scandinavian DXers, arranged for a special one-off transmission, using a spare utility sender. Many listeners around the world did hear this, yet there apparently were some who did miss out.

To overcome this, another special broadcast has been scheduled for the 15th of October between 20 and 23 hours UTC. It will be in English. The frequency will again be 11092 kHz USB but this is only nominal as it did appear to drift around slightly. Also there are a number of close facsimile outlets which caused a little trouble last time around. The address for QSL reports will be given on "Media Network" over Radio Netherlands on October 14th.

On Sunday the 3rd of October, Tasmania will be advancing its clocks for six months to be UTC + 11. The state government has further decided that this will be a permanent feature of the summer months. You may recall that I have been critical, in this column, of Tasmania being out of step with Victoria and NSW for a six week period. This, sadly, will continue as no consensus could be reached between the various administrations. NSW, Victoria and South Australia will be introducing Daylight Saving on Sunday October 31st, for four and a half months. This means that there will be six weeks when Tasmania will be at UTC + 11 and will mean that the popular Tuesday night "Tassie Devil Net on 3.59 MHz will be heard from October 5th at 0900 UTC.

The 48th edition of The World Radio TV Handbook is due to be published in early January. The cost should around $40. As it is usually a while before it's in the local bookstores, several clubs arrange for bulk shipments. Arthur Cushen, who has been writing about shortwave for close on 50 years now, has been acting as an agent for the WRTH and several clubs have obtained their supplies of this and other SWL related publications. Arthur has let me know that he will obtaining both the WRTH plus the 1994 Passport to World Band Radio. The cost for each should be around the figure given earlier. For further details, write to Arthur Cushen MBE, 212 Earn Street, Invercargill NZ.

The other interesting news is that a "Radio Free Somalia" has been logged in Sri Lanka. The status of the station appears to be clandestine. A 100 watt transmitter is reportedly being used between 7460 and 7475 kHz. Times given on "Media Network" were between 0400 and 0515 and 1600 to 1815 UTC. The MN report also stated reports should be sent to Mr Sam Voron, Sydney, Australia. An amateur radio station had also been set up but, in my humble opinion, the legality of the operation is rather questionable as there isn't any recognized Somali administration in existence, outside of the UN peacekeeping troops, to give out licenses.

Now for some snippets. Radio Georgia, in the former USSR, has reportedly been heard in English on 11910 kHz between 0730 and 0800 UTC. No sign of it here, though. Radio Kiribati in the Central Pacific is heard on USB from 0600 to 0800 UTC on 9825. The Khmer Rouge radio station, in or near Cambodia, has been consistently heard on 5408 kHz at 1300 UTC. It is in Khmer but an English segment has been noted. American religious broadcaster, WJCR, recently launched an appeal for funds to erect a tower to broadcast to China. Stating that they were the first to do so for over 40 years, they conveniently over-looked the efforts of Trans World Radio, FEBC, KSDA, etc who have been broadcasting within this region for some time.

Well, that is all for October. If you have any news, please feel free to write to me at 52 Connaught Crescent, West Launceston TAS 7250. I can also be reached by Packet as VK7RH @ VK7BBS.

Until next time, the very best of listening from Robin L Harwood VK7RH. ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

R J (Jeff)	WHYTE	VK2AHM
E C (Ernest)	BROWN	VK2AJ
R (Russell)	KING	VK2JS
D J (Desmond)	HAYWARD	VK3BSB
H H (Hugh)	OSMAN	VK5OZ

R J (Jeff) Whyte VK2AHM

Jeff Whyte VK2AHM died 3rd September 1993. He was born in Pt Augusta in 1908 and developed an interest in radio early enough to have a crystal set built in time to hear the first broadcasts from an Adelaide station. However, his early life, which included droving cattle for Sidney Kidman and managing a sheep station, did not leave much time for the pursuit of hobbies.

In 1937, having married and settled on a sheep station, Willow Point, Jeff found the time to obtain his amateur licence.

He became an ardent CW DXer and with 2, 3 or 4 watts worked the world from his shack on the bank of the Great Anabranch of the Darling River. With only limited battery power available he frequently operated by candle light!

After the war he improved the arrangement, but his phone contacts easily recognised him by the thump of the nearby diesel generator.

In 1971 he retired to Wentworth where he continued his active life, as a Rotarian, a shire councillor, the district's historian, a keen golfer and, of course, a radio amateur.

Jeff will be sadly missed by all his family and all the people who knew him through his various activities. He will be particularly missed by those in the local amateur community whom he helped and guided, and those VEs and Gs who regularly communicated with a real gentleman from outback Australia.

Geoff VK3ACZ & Marilyn VK3DMS

E C (Ernie) Brown VK2AJ

Ernest Charles Brown VK2AJ became a silent key on 19th July 1993 in his 80th year. He gained his 2nd class COP during the 1930s, built his own equipment, obtained his amateur licence, and commenced his long radio career.

From 1930 until 1940 he was a corporal in the 55/53 Militia Btl and was engaged in the construction and servicing of military equipment and the training of personnel.

During this period it was permissible to transmit on the broadcast bands after midnight when the regular stations closed. Ernie became involved in the broadcast of request numbers with some assistance from a neighbour who had a phone.

His brother Allan recalls trying to get some sleep one Christmas eve when Ernie had the Salvation Army brass band and choir on the verandah broadcasting carols.

From 1940 until 1945 Ernie chose to join the RAAF rising to the rank of WO. He was engaged in forward operational areas handling sensitive communications for the allied forces.

His knowledge of communications and HF DF working stood by him during his various roles in the DCA Aeradio/Communications organisation from 1945 until retirement in 1974.

Ernie was a well liked, easy going gent who willingly shared his vast knowledge with all and sundry. He will be sadly missed by family, friends and members of the net which bears his name.

D Reynold VK2ANW

ar

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Z Match Saga

Geoff Combs VK4GWC (OTY Aug) is an optimistic newcomer or a cynical old timer. I suspect the former; who else would predict 1996 for the end of the Z match saga? By the year 1996, Geoff, the Z match speculation will have dragged on for nearly forty years and it will continue as long as writers and readers reject mathematical evidence.

I have a name for technical logic which rejects the aid of mathematics; it is "Paddy Logic". Paddy lost his house keys on his way home from the pub one dark night; he confined his search to the area under street lights because, if he were to find them, that would be the only place he could find them.

The Z match required illumination beyond the limits of verbal speculation. The truth can be told with the aid of a few lines of simple mathematics.

Lindsay Lawless VK3ANJ
Box 760
Lakes Entrance 3909

AR on Tape

In "Over to You" in May, I was most interested to read of the Royal Victorian Institute for the Blind being involved in four track readings of Amateur Radio magazine for the print handicapped.

I would like to add my little bit. Around 1985 the Queensland Tape Service for the Handicapped — all volunteer narrators — obtained copyright permission to produce two track versions with myself at the mike. That went on for some months, until it was realised that there was in fact a four track version available. Because we were duplicating a service (and, of course, using extra cassettes — some nine per issue), the service here was discontinued. However, the school at Narbethong, Buranda Brisbane through their Low Incidence Support Centre of Visual Impairment Services approached me personally to continue. I gladly agreed under the same auspices, that of the QTSH and of course the WIA.

That service started on two track tapes in March 1986 and continued monthly until recently when, sadly, the recipient, Michael Johnston VK4AZR became an SK.

Michael's passing has broken a very pleasant association I have had with AR and, most particularly, Michael. Although I did not meet him in person, he was a delight to talk to by phone. He often expressed his gratitude for this means by which interesting features of AR and his hobby could be passed on to him. The satisfaction he received was evident each time we spoke.

Michael, I know, will be sadly missed at Narbethong, both as a teacher and as a person, and it also leaves somewhat of a void at this address.

At the moment my continued involvement with AR and the Service is in limbo. However, if any further or future need arises, Narbethong will be in touch with either myself personally or more formally with the Queensland Tape Service for the Handicapped and then, depending on the outcome, I will be happy to continue my previous involvement.

Hoping these remarks will be of interest in view of Elizabeth Pennington's letter.

Peter Bauers
27 Hutton Road
Aspley QLD 4034

Torch TVI

I read the letter from Ted VK3ALT in March Amateur Radio magazine concerning interference from re-chargeable torches.

I have seen quite a number of these devices cause trouble and, despite assurances from the manufacturer/importer that the problems would be fixed, I find no evidence that the devices have been altered.

I have only observed the problem on the screen as a single bar of interference about 3-4 cm wide, often nearly white, with scalloped edges about the same width extending out either side of the central interference bar. There is only one bar as the charging circuit used in the torches is only a half wave diode. The interference is generated by the regulator transistor located near the on-off switch. It would appear that many of the transistors are extremely high gain and the layout of the circuitry is such that the device acts as an oscillator tuned to Band III Television (174 — 222 MHz).

I have seen these devices cause interference on any channel between 6 and 10. You can easily determine if one of these devices is causing the trouble by turning the power off, taking care not to disturb the power leads. However, the device may not immediately start causing interference when next turned on. In some cases the interfering signal may show up on another channel altogether, and some torches never cause interference!

On another point, I appreciate the EMC column that appears from time to time and feel that the amateur radio fraternity should read and absorb more of the information available in that column. Our fellow amateurs are often critical of what the anonymous "they" should do. One example is to do with the 148-150 MHz pagers and the problems that they cause some of our amateur 2 metre gear. Although many complain bitterly about the problem very few have bothered to do anything about it by obtaining a suitable filter!!

Cheers for now, and keep up the good work.

Rodney **Champness VK3UG**
17 Helms Court
Benalla VIC 3672

Callsign Number Plates

Besides amateur radio, one of my other hobbies is collating information on, and collecting, Australian motor vehicle number plates. I understand that only three Australian states issue amateur radio callsign plates. They are VK2, VK3 and VK5.

To assist me in my hobbies, I would appreciate colour photographs or written information on plates that amateurs may have on their vehicles including state, colour, slogan, hyphen position, cost, etc. If many photographs are received, I would like to publish a selection of them in Amateur Radio magazine and also the Number Plate Collectors" Club (Australia) magazine.

Any information on this subject will be most appreciated.

Barrie Lakey **VK3BL**
18 Raymond **Ave**
Bendigo VIC 3550

(Several amateurs associated with AR have callsign number plates, and there is a possibility of featuring them on a front cover in the near future. Ed) ar

VHF/UHF — An Expanding World

Eric Jamieson VK5LP

All times are UTC

Australian Amateur Bands Beacons

Frequency	Call sign	Location	Grid square	
50.046	VK8AS	Alice Springs	PG66	
50.053	VK3SIX	Hamilton	QF02	
50.056	VK8VF	Darwin	PH57	
50.057	VK7RSB	Hobart	QE37	1
50.057	VK4	Gold Coast ?		2
50.066	VK6RPH	Perth	QF78	
50.0775	VK4BRG	Sarina	QG48	
52.325	VK2RHV	Newcastle	QF57	
52.345	VK4ABP	Longreach	QG26	
52.370	VK7RST	Hobart	QE37	
52.420	VK2RSY	Sydney	QF56	
52.425	VK2RGB	Gunnedah	QF59	
52.440	VK4RTL	Townsville	QH30	
52.445	VK4RIK	Cairns	QH23	
52.445	VK4RBM	MacKay	QG48	
52.450	VK5VF	Mount Lofty	PF95	
52.470	VK7RNT	Launceston	QE38	1
144.022	VK6RBS	Busselton	QF76	
144.400	VK4RBB	Mount Mowbullan	QG62	
144.410	VK1RCC	Canberra	QF44	
144.420	VK2RSY	Sydney	QF56	
144.445	VK4RIK	Cairns	QH23	
144.445	VK4RTL	Townsville	QH30	
144.445	VK4RBM	MacKay	QG48	
144.450	VK5VF	Mount Lofty	PF95	
144.460	VK6RPH	Perth	QF78	1
144.465	VK6RTW	Albany	QF84	
144.470	VK7RMC	Launceston	QE38	
144.480	VK8VF	Darwin	PH57	
144.485	VK8RAS	Alice Springs	PG66	
432.066	VK6RBS	Busselton	QF76	
432.160	VK6RPH	Perth	QF78	1
432.410	VK1RBC	Canberra	QF44	
432.420	VK2RSY	Sydney	QF56	
432.440	VK4RSD	Brisbane	QG62	
432.445	VK4RIK	Cairns	QH23	
432.445	VK4RTL	Townsville	QH30	
432.445	VK4RBM	MacKay	QG48	
432.450	VK3RAI	MacLeod	QF22	
432.450	VK5VF	Mount Lofty	PF95	
432.537	VK3RMB	Mount Buninyong	QF12	1
1296.198	VK6RBS	Busselton	QF76	
1296.410	VK1RBC	Canberra	QF44	
1296.420	VK2RSY	Sydney	QF56	
1296.440	VK4RSD	Brisbane	QG62	
1296.445	VK4RIK	Cairns	QH23	
1296.450	VK5VF	Mount Lofty	PF95	
1296.460	VK6RPH	Perth	QF78	
2304.445	VK4RIK	Cairns	QH23	
2306.440	VK4RSD	Brisbane	QG62	
10445.000	VK4RIK	Cairns	QH23	

1. Operation of these beacons is doubtful. Any advice please?

2. I have heard that a beacon exists in this area and running FSK?

The Australian beacon list has not been published for some time. There may be others listed which should also be queried. It would be appreciated if beacon custodians could advise the present status of their beacons please.

To VK5 stations the absence of beacons in Melbourne and Mount Gambier is very frustrating as these areas are on the prime route for ducting from Albany. Apart from VK6RTW in Albany on 144.465, stations in VK5 have no beacons by which to monitor the progress of inversions/ducts across the Great Australian Bight or for enhanced conditions between Adelaide and Melbourne.

The value of the reliable Adelaide beacons has been proven time and again. The most recent instance occurred during June and July when 144 and 432 MHz opened to Canberra (see report below). On both occasions VK1DO phoned Roger VK5NY to advise that he was hearing the Adelaide beacons, this information leading to contacts.

144 and 432 MHz

Two large inland high pressure systems produced good conditions during June and July. Roger **VK5NY** reports that on 16 June, he received a morning phone call from VK1DO to report reception of the Adelaide beacons on 144 and 432. At 0037 5x2 reports were exchanged with VK1DO (who lives right in Canberra — a very difficult VHF area); 432 was tried but they were unable to make a definite two-way contact. At 0102 Roger worked VK3DUT on 432 and 50 MHz, VK5NC on 432, at 0148 VK1AU 5x2 and 0155 VK3ZQB on 144, VK3AUI on 50, at 0235 VK7KAP in Devonport at 5x5 on 144 and

a scratchy 3x2 on 432, 0315 VK7DC on 432 and four minutes later on 144. The two bands remained opened for most of the day and to some areas the following morning. During the above period, Bill VK5ACY on Kangaroo Island had successful contacts with VK7KAP 5x4 and VK3ZQB 5x5 on 144.

The second occasion was the receipt by **Roger VK5NY** of a 0631 am (local) phone call from **VK1DO** informing him the band was open again on two metres. Soon after a successful 5x2 contact was made. Both VK5ACY and Trevor VK5NC tried to work VK1DO but were unsuccessful.

Roger reported that the latter opening, in particular, appeared to be confined to the inland areas, this being the reason VK5NC and VK5ACY missed out. My proximity to the coast would no doubt have excluded me had I been available.

Six Metres

Ted **Collins G4UPS** in his July letter reports the following:

- Alan KD4MAE expects to operate on six metres from the US embassy in Saudi Arabia, using the callsign 7Z1AB with an Icom 551D and five element yagi. QSL route is via KN4F and Alan expects to stay two years.
- San Marino was activated with the callsign T70A between July and September. Good conditions on 7/7 allowed many contacts to the UK.
- Seppo OH1VR was active from Market Reef as OJ0/OH1VR and made about 150 six metre contacts with nineteen different countries between 9 and 12/7. Ted says *Market Reef is a small rocky island, situated between Aland Island (OH0) and Sweden. Maximum elevation is one metre above sea level and the island is uninhabited except for a seabird colony. Only buildings are an unattended automated lighthouse and a weather observation station. Seppo had to cut short his reef stay due to high winds requiring him to be removed by helicopter because the scheduled boat could not reach him due to the storms.*
- Macedonia was activated in July for the first time on six metres when a transverter was sent to Z31DX.
- Iceland was activated between 29/7 and 11/8 by an expedition signing TF/G4VXE The July report also gives a day-by-day coverage of the Es contacts to 21/7. I think Australian amateurs would find it hard to comprehend the degree of activity which is possible from Europe and the UK during strong Es openings. We are well aware of our Australia wide coverage and its extensions which include New Zealand, New Guinea and some of the Pacific island nations. But in Europe there are 50 countries, all within Es range. There must be many areas where six metres is always available via ground wave, tropo, Es and TE, and where the ordinary 200 km distance for six metre working always results in a contact.

To 21 July the following prefixes/countries were worked: 4N1, 4Z4, 5B4, 9A1, 9A2, 9A3, 9H1, 9H5, 9K2, C31, CN8, CQ7, CT0, CT1, CT4, CU1, DJ6, DK5, DL1, DL2, DL7, DL8, EH1, EH2, EH3, EH6, EH7, EH8, EH9, ES1, ES3, EV5D, F1, F5, F6, F8, HB9, HV4, I2, I4, I5, IC8, IK0, IK6, IN7, IO6, IS0, IT9, K1, LA1, LA3, LA5, LA6, LA7, LA8, LA9, LX0, OD5, OE1, OE2, OE5, OE6, OH1, OH2, OH3, OJ0, OK1, OK2, OK8, OM3, OY3, OY9, OZ1, OZ4, OZ5, OZ6, OZ7, PA3, S51, S55, S57, S59, SM0, SM3, SM5, SM7, SP5, SV1, SV5, T70A, TF, VE1, W2, W4, WA1, YL2, YT1, YU1, YU2, YU7, ZB2.

Those 101 prefixes represent 40 countries, not a bad effort for three weeks of work on the band! Where else in the world could you work 40 countries via Es on what is probably the down-side of their summer season. Incredible. Apparently some are becoming tired of having so many stations to work — well, what's wrong with 144, 432 and 1296 MHz?

The July issue of *Six News*, the journal of the UK Six Metre Group, indicates moves are afoot to obtain an increase in power for UK six metre stations, some suggesting that it be 400 watts.

The same issue contains details of a 450 watt solid state six metre amplifier using a pair of BLW96s or MRF448s requiring 50 volts at 20 amps and about 20 watts drive. The author of the article is Chris G3WOS and he includes considerable construction detail. Now that F2 contacts are disappearing, this may be the time for those requiring our 400 watts power limit on six metres to commence building in readiness for Cycle 23.

Also from *Six News* is an item that *SIDC Brussels suggests a first tentative forecast of the timing of the forthcoming cycle minimum as arriving probably between November 1995 and September 1996, which would mean a Cycle 22 length of between 9 and 10 years.*

As a result, everyone can look forward to increased Es availability, especially on two metres. I would like to suggest that we pay more attention to 432 MHz during high Es activity as it is just possible that Es propagation, under certain circumstances, could extend to that band. Some will suggest that any contacts which may eventuate were by means other than Es. This may be true but usually Es precludes working stations at shorter distances whereas tropo often means there are other stations along the same path. Anyway, it's a thought which deserves some attention.

As this issue will appear during the spring equinox it will be interesting to see whether any long distance contacts eventuate. The following month of November should see the start of the usual summer Es activity. I wonder how it will compare with that of Europe?

Closure

Everything must be very quiet as I have found it difficult to assemble much about which to write so rather than babble on I will end now.

Closing with two thoughts for the month:

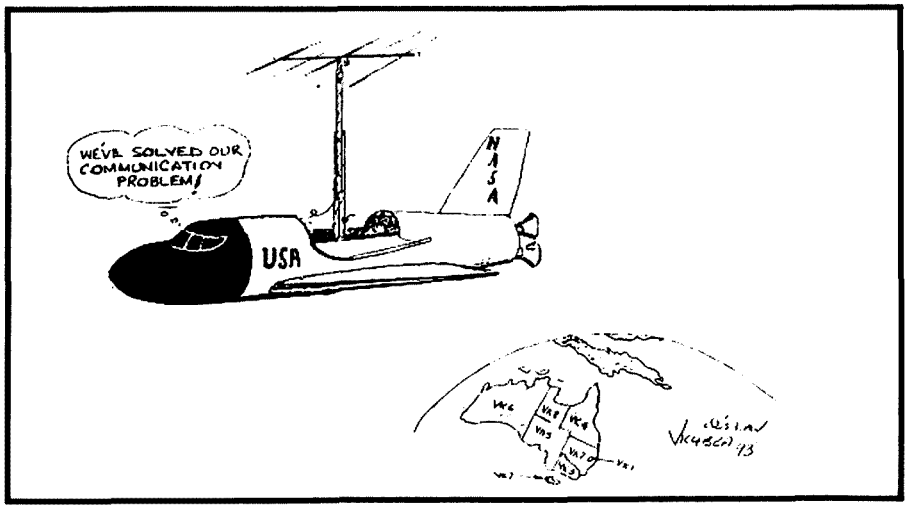
1. Just when you think you have graduated from the school of experience, someone thinks up a new course; and

2. The younger generation isn't so bad. It's just that they have more critics than models.

73 from The Voice by the Lake.

PO Box 169 Meningie South Australia 5264

ar



HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 49.6. The predicted values for November and December are 47.2 and 45.1 respectively. **ar**

VK EAST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.4	25	25.7	35	37	36	32	28
2	30.6	25	25.5	35	37	36	33	28
3	30.6	25	25.3	37	38	36	33	28
4	30.1	26	24.7	38	39	37	33	28
5	29.2	27	23.7	41	40	38	33	28
6	27.9	28	22.3	45	42	39	33	27
7	26.2	30	20.8	49	44	40	33	25
8	24.5	32	19.5	50	44	38	31	22
9	22.8	33	18.1	49	43	37	28	18
10	21.4	34	17.0	49	41	35	25	14
11	20.5	35	16.2	48	40	33	23	11
12	19.4	36	15.4	47	39	31	20	8
13	18.3	36	14.5	46	37	28	16	3
14	17.3	37	13.6	45	35	25	12	-1
15	16.5	38	12.8	44	33	23	9	-5
16	15.1	39	11.7	42	29	18	3	-13
17	13.8	40	10.6	39	25	12	-4	-22
18	14.5	40	11.0	41	27	15	0	-17
19	18.0	34	13.6	41	34	25	14	1
20	22.9	29	17.7	40	37	32	25	17
21	26.6	27	20.9	38	38	35	30	24
22	28.3	26	22.6	37	37	35	31	26
23	29.0	26	23.6	36	37	35	31	26
24	29.6	25	24.5	35	37	35	32	27

VK EAST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.1	2	9.2	4	0	-9	-24	...
2	12.3	-3	9.3	1	0	-8	-21	-37
3	16.6	2	12.5	-2	3	1	-5	-14
4	23.2	7	17.8	-7	5	7	6	1
5	28.5	8	22.3	-13	3	8	10	8
6	28.9	8	23.6	-14	3	6	10	9
7	28.1	8	22.8	-13	3	8	10	8
8	26.8	9	21.6	-9	5	9	10	7
9	25.4	10	21.4	-1	9	12	10	6
10	23.8	12	18.9	6	14	14	11	5
11	22.2	14	17.6	15	18	16	10	3
12	20.9	17	16.6	22	21	17	9	0
13	20.1	21	15.9	29	24	18	9	-2
14	19.1	24	15.1	34	26	18	7	-5
15	18.2	25	14.4	34	25	16	4	-10
16	17.2	26	13.5	34	24	13	0	-15
17	16.4	27	12.8	33	22	11	-4	-20
18	15.1	28	11.7	31	18	5	-11	-30
19	13.8	29	10.6	28	13	-1	-20	...
20	14.5	29	11.1	29	15	2	-15	-35
21	17.8	25	14.1	34	25	15	2	-11
22	15.5	23	12.0	25	16	6	-6	-24
23	14.4	18	11.1	18	10	1	-13	-30
24	14.4	12	11.1	12	7	0	-13	-29

VK EAST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.1	10	10.3	10	5	-3	-16	-32
2	13.3	5	10.2	6	3	-3	-16	-31
3	13.7	2	10.5	3	3	-3	-13	-27
4	17.3	5	13.1	0	5	3	-3	-12
5	22.1	6	16.2	-3	6	7	3	-2
6	22.5	6	16.6	-5	5	6	4	-1
7	22.7	6	16.7	-5	5	7	4	-1
8	21.7	6	16.5	-3	6	6	3	-2
9	20.3	7	16.1	1	7	7	2	-5
10	18.7	8	14.7	5	8	6	0	-10
11	17.1	9	13.5	8	9	4	-4	-16
12	15.8	11	12.4	12	9	2	-9	-22
13	14.8	15	11.7	15	9	0	-13	-29
14	14.1	19	11.2	19	9	-1	-17	-35
15	13.6	24	10.7	23	10	-3	-21	...
16	13.2	27	10.2	23	9	-5	-25	...
17	12.8	28	9.5	23	7	-7	-29	...
18	12.2	30	9.1	22	5	-12	-34	...
19	11.8	30	8.6	21	3	-14	-38	...
20	12.4	29	8.5	23	5	-11	-33	...
21	12.0	27	8.3	20	3	-13	-36	...
22	11.6	22	8.1	15	0	-16	-38	...
23	11.4	16	8.1	11	-1	-16	-37	...
24	12.2	11	8.8	10	1	-11	-28	...

VK EAST EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.1	-2	8.0	2	-3	-14	-30	...
2	10.5	-9	7.7	0	-4	-14	-30	...
3	11.0	-10	8.2	-1	-3	-11	-25	...
4	13.3	-5	9.3	-3	0	-5	-15	-27
5	16.7	0	12.5	-6	1	0	-5	-14
6	19.9	3	15.0	-9	2	3	1	-5
7	22.3	6	16.8	-9	3	6	4	0
8	23.9	8	18.0	-5	6	9	7	3
9	25.0	11	16.9	2	12	13	11	6
10	23.9	14	19.1	12	18	17	13	7
11	22.5	17	17.9	21	22	19	13	5
12	21.2	19	16.9	26	24	19	12	2
13	20.5	21	16.2	31	26	20	11	0
14	19.5	24	15.4	35	27	20	9	-3
15	18.4	25	14.5	35	26	17	5	-8
16	17.3	27	13.6	35	24	14	0	-14
17	16.3	27	12.8	33	22	11	-4	-21
18	14.9	28	11.2	30	17	4	-12	-32
19	13.4	29	10.0	27	11	-3	-23	...
20	13.1	28	9.2	24	7	-9	-31	...
21	12.4	26	8.7	20	3	-13	-37	...
22	12.0	20	8.6	14	0	-15	-38	...
23	11.9	12	8.4	10	-1	-14	-33	...
24	11.6	5	8.3	6	-2	-13	-31	...

VK EAST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.4	9	21.4	-3	8	10	9	5
2	22.9	10	18.1	4	11	11	7	1
3	20.1	11	15.9	10	13	10	4	-5
4	18.1	14	14.3	16	14	9	0	-12
5	16.9	18	13.4	21	15	8	-4	-18
6	16.1	21	12.7	25	16	6	-7	-23
7	15.4	24	12.2	28	16	4	-11	-29
8	15.0	26	11.8	28	16	3	-13	-33
9	14.5	27	11.3	28	14	1	-17	-38
10	13.3	29	10.3	25	9	-6	-27	...
11	11.8	30	9.1	21	2	-16	...	...
12	12.2	30	9.3	22	4	-13	-37	...
13	15.6	27	12.3	31	18	6	-10	-28
14	14.0	27	10.8	26	12	0	-19	-39
15	13.6	21	10.5	20	9	-3	-20	...
16	15.1	16	11.7	17	11	2	-11	-26
17	13.6	8	10.5	9	4	-4	-17	-33
18	14.2	3	10.8	3	3	-2	-13	-27
19	17.7	4	13.4	-1	4	3	-2	-11
20	22.6	6	17.5	-7	4	7	5	0
21	26.2	7	20.6	-12	3	8	8	5
22	27.8	8	22.2	-13	3	8	9	7
23	28.3	8	23.0	-13	3	8	10	8
24	27.8	8	22.3	-9	5	9	10	7

VK EAST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.7	14	24.6	15	21	22	20	16
2	30.8	14	23.6	13	21	22	21	17
3	31.3	14	24.3	13	21	22	21	17
4	31.6	14	26.1	14	22	23	21	18
5	31.4	14	25.7	16	23	24	22	18
6	30.5	15	24.8	19	24	25	22	18
7	29.2	16	23.5	24	27	26	22	17
8	27.8	17	23.4	31	31	28	22	16
9	26.5	19	21.2	39	35	30	23	15
10	25.1	20	20.0	40	35	29	21	11
11	23.9	21	19.0	41	34	28	18	8
12	23.2	22	18.4	42	34	27	17	6
13	22.1	22	17.5	42	33	25	14	2
14	20.7	23	16.6	40	30	21	9	-4
15	19.2	24	15.1	38	27	17	3	-12
16	18.0	24	14.1	36	24	12	-3	-20
17	16.2	25	12.6	32	18	4	-14	-34
18	14.3	26	11.1	27	9	-7	-30	...
19	13.6	26	10.5	24	4	-14	-39	...
20	13.3	26	10.2	22	2	-17	...	...
21	19.0	20	15.0	31	23	13	0	-15
22	27.1	16	21.1	28	28	26	20	13
23	29.0	15	23.2	22	26	25	21	16
24	29.1	14	23.7	17	23	23	20	15

VK EAST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.3	1	8.2	4	0	-6	-19	-35
2	12.2	4	8.3	6	1	-7	-21	-38
3	12.0	7	8.2	8	1	-9	-24	...
4	11.4	11	8.0	9	0	-12	-30	...
5	10.9	15	7.7	10	-2	-17	-38	...
6	11.4	20	8.2	14	0	-15	-36	...
7	13.7	24	10.0	23	10	-1	-19	-38
8	17.2	22	12.6	29	20	11	-1	-15
9	14.9	21	11.4	21	14	6	-6	-20
10	14.6	14	11.1	14	10	4	-7	-20
11	15.6	7	12.3	6	7	2	-6	-17
12	14.9	1	11.7	0	3	0	-8	-18
13	14.3	-4	11.3	-4	0	-2	-9	-18
14	13.9	-9	10.8	-7	-1	-3	-9	-19
15	13.4	-12	10.4	-9	-2	-3	-9	-19
16	12.7	-16	9.8	-9	-2	-4	-10	-20
17	12.3	-18	9.3	-8	-2	-4	-11	-21
18	13.1	-14	9.9	-9	-2	-4	-10	-19
19	15.5	-7	12.2	-12	-2	-1	-6	-13
20	18.5	0	12.6	-13	-1	0	-2	-7
21	16.3	-2	11.0	-8	0	0	-5	-13
22	14.6	-3	9.9	-4	0	-2	-9	-19
23	13.5	-2	9.1	-1	1	-3	-12	-24
24	12.8	0	8.6	2	1	-5	-16	-30

VK SOUTH AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.0	16	10.3	15	8	0	-15	-32
2	14.6	12	11.1	12	8	0	-12	-27
3	18.2	12	14.4	11	12	8	0	-9
4	22.4	10	16.5	6	12	11	7	0
5	23.4	9	17.2	2	10	10	7	1
6	23.5	8	17.1	0	9	10	7	1
7	23.2	8	16.8	0	8	9	6	1
8	22.7	8	16.2	0	8	9	5	0
9	21.9	8	15.5	2	9	9	5	-2
10	20.6	9	14.4	6	11	9	3	-4
11	18.9	11	13.1	10	11	8	0	-10
12	17.1	12	11.9	13	11	5	-5	-17
13	15.6	14	10.8	16	10	2	-10	-25
14	14.5	18	10.0	19	10	-1	-17	-35
15	13.8	24	9.5	23	10	-3	-22	...
16	13.2	26	9.0	23	8	-7	-27	...
17	12.8	28	8.8	23	6	-9	-31	...
18	12.4	29	8.7	22	4	-12	-35	...
19	12.0	30	8.6	21	2	-15	-39	...
20	12.1	29	8.7	21	3	-14	-38	...
21	12.8	29	8.9	24	7	-9	-31	...
22	12.3	25	8.7	20	4	-12	-34	...
23	12.2	21	8.8	16	2	-12	-33	...
24	13.1	18	9.5	16	5	-7	-25	...

VK SOUTH ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.3	12	18.9	10	15	14	9	2
2	23.5	11	19.5	8	14	14	9	3
3	23.8	11	20.1	7	14	14	10	3
4	23.7	11	19.8	8	14	14	10	3
5	23.6	12	19.5	9	15	14	10	3
6	23.3	12	19.1	12	16	15	10	3
7	22.7	14	18.4	16	18	16	10	1
8	21.6	15	17.3	22	21	16	8	-1
9	20.2	20	16.1	32	25	17	6	-6
10	18.7	22	14.8	34	24	14	0	-15
11	17.3	23	13.7	32	20	8	-7	-25
12	16.1	24	12.7	30	16	2	-16	-37
13	15.3	24	12.1	28	12	-2	-23	...
14	14.6	25	11.5	26	9	-7	-30	...
15	14.0	25	11.1	24	6	-11	-36	...
16	13.5	25	10.6	22	2	-16	...	...
17	13.1	25	10.2	20	0	-20	...	...
18	12.3	26	9.5	16	-7	-29	...	...
19	11.6	26	8.9	12	-13	-38	...	...
20	11.8	25	9.1	12	-13	-37	...	...
21	14.8	22	11.2	24	9	-5	-26	...
22	18.5	15	14.2	21	16	9	-2	-16
23	21.3	13	16.7	17	17	14	6	-3
24	22.7	12	18.1	13	16	14	9	1

VK SOUTH USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.6	10	19.9	-3	8	11	11	8
2	24.7	11	19.6	3	12	13	10	5
3	21.7	12	17.2	11	15	13	8	0
4	19.6	15	15.5	17	16	12	4	-5
5	18.4	18	14.6	22	18	12	2	-10
6	17.5	21	13.8	26	19	11	-1	-15
7	16.6	24	13.2	30	20	10	-4	-20
8	18.1	26	12.6	31	19	8	-7	-24
9	15.4	27	12.0	30	18	5	-11	-29
10	13.9	28	10.8	27	12	-1	-21	...
11	12.1	30	9.3	22	4	-13	-37	...
12	12.4	30	9.5	23	5	-11	-34	...
13	15.3	27	12.1	31	18	5	-11	-29
14	14.8	25	11.6	27	15	3	-14	-33
15	14.3	20	11.1	21	11	0	-16	-34
16	13.6	13	10.4	12	5	-4	-19	-37
17	13.0	5	9.9	6	2	-8	-20	-37
18	13.8	1	10.4	1	2	-4	-14	-28
19	16.6	2	13.0	-2	3	1	-5	-15
20	20.4	4	15.6	-8	3	4	2	-4
21	23.6	6	18.3	-12	2	6	5	2
22	25.4	7	20.2	-14	2	6	7	4
23	26.2	7	21.3	-13	2	7	8	5
24	26.4	8	21.9	-10	4	9	9	6

VK WEST EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.1	-13	7.7	-3	-5	-11	-24	-39
2	10.9	-10	7.7	-2	-5	-13	-27	...
3	10.6	-7	7.5	-1	-6	-16	-31	...
4	10.2	-4	7.3	0	-8	-19	-37	...
5	9.7	-1	7.1	0	-10	-24	...	...
6	10.2	5	7.5	3	-9	-24	...	...
7	12.0	11	9.0	9	-2	-14	-33	...
8	14.7	14	11.0	15	7	-2	-16	-33
9	17.6	15	13.2	20	14	7	-4	-17
10	18.1	16	12.6	21	16	10	0	-10
11	14.3	12	11.0	12	7	-1	-14	-28
12	13.2	5	10.2	6	2	-5	-17	-32
13	14.4	1	9.7	1	1	-3	-13	-25
14	13.8	-5	9.2	-4	-1	-5	-14	-25
15	13.2	-11	9.0	-8	-3	-6	-14	-24
16	12.7	-16	8.6	-10	-4	-7	-14	-24
17	12.3	-19	8.5	-10	-5	-7	-14	-24
18	11.9	-21	8.3	-10	-5	-7	-14	-25
19	11.7	-22	8.3	-10	-5	-7	-15	-25
20	12.5	-19	9.0	-11	-5	-7	-13	-23
21	14.5	-12	9.7	-13	-5	-5	-11	-19
22	13.1	-15	9.2	-10	-5	-7	-13	-23
23	12.2	-16	8.5	-8	-4	-8	-16	-28
24	11.5	-15	8.0	-5	-4	-10	-20	-33

VK SOUTH EUROPE L/P

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.6	-2	7.9	2	-2	-11	-25	...
2	11.4	1	7.9	4	-2	-12	-29	...
3	11.1	5	7.8	5	-3	-15	-34	...
4	10.6	9	7.6	6	-6	-20	...	...
5	10.1	13	7.3	6	-9	-26	...	...
6	10.6	18	7.8	9	-7	-24	...	...
7	12.6	23	9.3	18	3	-11	-32	...
8	15.6	22	11.6	25	15	4	-11	-28
9	17.1	21	11.9	27	19	10	-1	-15
10	13.5	17	10.5	17	8	-2	-17	-35
11	13.1	12	10.0	11	5	-4	-18	-35
12	13.9	6	9.6	6	4	-2	-14	-28
13	13.3	-1	9.3	0	1	-4	-14	-27
14	12.9	-7	8.9	-3	-1	-5	-14	-26
15	12.5	-12	8.7	-5	-2	-5	-13	-25
16	12.0	-16	8.5	-6	-2	-5	-13	-24
17	11.9	-18	8.5	-7	-2	-5	-13	-24
18	12.7	-15	9.3	-9	-2	-4	-11	-21
19	14.7	-10	10.0	-11	-3	-3	-7	-15
20	17.2	-4	12.0	-13	-2	-1	-4	-11
21	15.1	-7	10.5	-10	-2	-2	-8	-16
22	13.6	-8	9.5	-6	-1	-4	-11	-22
23	12.7	-7	8.7	-3	-1	-6	-15	-28
24	12.0	-6	8.2	0	-1	-8	-20	-35

VK WEST AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.1	20	10.0	18	6	-6	-25	...
2	13.9	16	10.6	16	8	-1	-16	-34
3	17.6	14	13.9	15	14	8	-1	-13
4	22.6	12	17.7	11	15	13	8	0
5	24.0	10	18.0	7	13	13	9	2
6	23.9	9	20.0	4	11	11	8	2
7	23.8	9	19.7	3	10	11	7	1
8	23.5	9	19.2	3	10	10	7	1
9	22.9	9	18.5	4	11	10	6	0
10	21.9	9	17.5	6	11	10	5	-2
11	20.5	11	17.4	11	13	10	3	-5
12	18.8	13	14.9	15	14	9	0	-11
13	17.2	16	13.6	19	14	7	-4	-18
14	15.9	20	12.5	23	14	4	-10	-26
15	14.9	24	11.8	26	14	2	-15	-34
18	14.2	26	11.2	26	12	-1	-20	...
17	13.7	28	10.8	26	11	-4	-24	...
18	13.3	29	10.4	26	9	-6	-27	...
19	12.9	30	10.0	25	7	-9	-31	...
20	12.3	30	9.5	23	4	-13	-37	...
21	11.9	31	9.1	21	2	-16	...	...
22	12.8	30	9.6	24	7	-9	-32	...
23	13.0	29	10.0	25	8	-7	-29	...
24	12.3	24	9.4	19	4	-11	-33	...

VK WEST SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.3	12	20.6	13	18	17	13	7
2	25.8	12	21.2	13	18	17	13	7
3	25.8	12	19.3	14	19	18	14	7
4	25.7	13	21.5	15	20	18	14	8
5	25.6	14	21.1	18	21	20	15	8
8	25.2	15	20.6	23	24	21	16	8
7	24.4	17	19.5	29	27	23	16	8
8	22.9	20	18.1	34	29	24	15	5
9	21.1	23	16.7	38	30	22	11	0
10	19.4	24	15.4	38	28	19	7	-7
11	18.0	26	14.2	37	26	15	1	-13
12	17.0	27	13.5	36	24	12	-3	-19
13	16.1	28	12.7	34	21	9	-7	-26
14	15.3	29	12.1	33	19	6	-12	-31
15	14.8	29	11.7	31	17	3	-15	-36
16	14.4	30	11.2	30	15	1	-18	...
17	13.5	32	10.3	29	13	-2	-22	...
18	13.1	31	10.0	27	10	-5	-27	...
19	12.7	27	9.7	23	7	-8	-30	...
20	13.6	22	10.3	20	9	-4	-22	...
21	16.2	17	12.8	20	14	5	-7	-23
22	19.9	15	15.2	18	17	13	4	-8
23	22.8	14	17.8	16	18	16	10	2
24	24.5	13	19.5	14	18	17	12	5

VK SOUTH SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.0	16	17.4	22	20	15	6	-5
2	21.1	16	17.9	22	21	15	6	-4
3	21.1	16	17.7	23	21	16	6	-4
4	21.0	17	17.4	25	22	18	7	-5
5	20.7	18	17.0	27	23	17	6	-6
6	20.2	20	16.3	31	25	17	5	-8
7	19.3	23	15.4	36	26	16	3	-12
8	18.0	25	14.2	36	24	13	-2	-19
9	16.6	26	13.1	34	20	7	-10	-30
10	15.2	28	12.1	32	16	0	-20	...
11	14.1	29	11.1	28	10	-6	-30	...
12	13.3	30	10.5	26	8	-12	-38	...
13	12.7	30	10.0	23	2	-17	...	...
14	12.2	31	9.7	21	-1	-22	...	...
15	11.8	31	9.3	20	-3	-25	...	...
16	11.3	33	8.7	18	-6	-30	...	...
17	10.9	32	8.4	14	-12	-37	...	...
18	10.5	32	8.0	12	-16	...	...	...
19	11.2	25	8.5	13	-9	-31	...	...
20	13.2	20	9.9	17	3	-12	-35	...
21	16.2	18	12.4	21	13	2	-13	-31
22	18.6	17	14.5	22	18	10	-1	-16
23	20.0	16	16.0	22	19	13	3	-9
24	20.8	16	16.9	22	20	15	5	-6

VK WEST ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.6	15	22.1	18	23	22	18	13
2	27.9	14	22.7	15	21	21	18	13
3	28.4	14	23.5	14	20	21	18	14
4	29.3	14	22.4	13	21	21	19	15
5	29.6	14	24.7	14	21	22	20	16
6	29.8	14	24.6	16	22	23	21	16
7	29.5	15	24.1	19	24	24	21	17
8	28.6	16	23.3	23	26	25	21	16
9	27.4	17	22.0	30	30	27	22	15
10	26.0	20	21.8	42	36	31	23	14
11	24.5	21	19.6	43	36	29	20	10
12	23.1	22	18.3	42	34	27	16	5
13	21.8	22	17.4	41	32	24	13	0
14	21.1	22	16.7	41	31	22	10	-3
15	20.1	23	15.9	39	29	19	6	-8
16	18.9	23	15.1	37	26	15	0	-16
17	17.8	23	14.0	35	22	10	-6	-24
18	16.8	24	13.1	33	19	5	-12	-33
19	15.3	24	11.9	29	12	-3	-25	...
20	13.5	25	10.5	21	0	-19	...	...
21	13.2	25	10.1	20	-2	-23	...	...
22	17.9	22	14.1	32	21	10	-6	-23
23	22.9	16	17.7	26	24	20	12	2
24	26.3	15	20.8	22	24	22	18	11

VK WEST MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.2	13	8.6	8	-6	-22	...	...
2	11.3	5	8.6	5	-5	-18	-39	...
3	15.4	7	12.2	6	5	-1	-12	-26
4	21.7	8	16.7	3	10	9	4	-2
5	25.3	9	19.2	-2	8	11	9	5
6	25.4	8	21.2	-5	7	9	8	4
7	25.4	8	21.0	-6	6	9	8	4
8	25.1	8	20.5	-6	6	9	8	4
9	24.4	8	19.8	-4	7	9	7	3
10	23.3	9	18.7	0	9	10	7	1
11	22.0	11	18.6	7	12	11	6	0
12	20.5	13	16.3	15	16	12	5	-4
13	19.0	17	15.1	23	19	12	2	-9
14	17.8	22	14.1	30	21	12	-1	-16
15	17.0	23	13.5	31	20	9	-5	-21
16	16.2	25	12.8	31	18	7	-9	-27
17	15.6	26	12.4	30	17	4	-13	-32
18	14.9	26	11.7	29	14	1	-18	-38
19	14.3	27	11.2	27	12	-2	-22	...
20	13.3	27	10.3	24	7	-9	-31	...
21	12.4	28	9.6	21	2	-16	...	...
22	13.1	28	10.0	23	6	-10	-33	...
23	14.4	26	11.2	27	13	-1	-20	...
24	13.5	22	10.4	20	6	-7	-27	...

VK SOUTH MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.2	6	9.4	7	0	-10	-26	...
2	12.3	0	9.4	3	0	-8	-22	-39
3	17.0	5	13.4	0	5	2	-4	-14
4	24.1	8	18.6	-5	6	9	7	3
5	25.8	7	21.6	-11	3	8	8	5
6	25.7	7	21.3	-13	2	7	7	5
7	25.4	7	20.7	-13	2	6	7	4
8	24.7	7	20.0	-11	3	7	7	3
9	23.6	7	18.9	-7	5	8	6	2
10	22.1	9	17.5	0	9	9	6	0
11	20.3	11	16.0	8	12	10	4	-3
12	16.6	14	14.7	15	15	10	1	-9
13	17.1	18	13.5	22	17	9	-3	-16
14	16.1	23	12.7	28	18	7	-7	-24
15	15.4	25	12.2	29	16	5	-11	-30
16	14.9	26	11.7	28	15	2	-15	-34
17	14.4	27	11.3	28	14	0	-18	-39
18	14.0	28	10.9	27	12	-2	-21	...
19	13.3	28	10.2	25	9	-6	-27	...
20	12.9	29	9.8	24	6	-9	-32	...
21	13.7	28	10.4	26	11	-3	-24	...
22	15.9	25	12.2	29	19	8	-6	-23
23	15.6	21	12.0	24	16	6	-7	-23
24	14.9	16	11.5	17	10	1	-12	-28

VK WEST EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.4	14	8.7	11	0	-13	-33	...
2	11.7	5	8.3	5	-3	-15	-34	...
3	12.2	0	8.8	2	-2	-12	-27	...
4	15.1	2	10.1	0	2	-2	-12	-25
5	19.3	4	14.1	-3	4	4	-1	-8
8	23.2	6	17.0	-8	4	6	5	0
7	25.6	7	18.8	-10	3	7	7	4
8	27.2	7	20.0	-11	4	8	9	6
9	27.2	8	20.8	-9	5	9	10	7
10	25.9	9	20.8	-4	8	10	10	6
11	24.5	11	20.6	4	12	13	10	5
12	22.9	13	18.2	14	17	15	11	4
13	21.4	17	17.0	23	21	17	10	0
14	20.1	20	16.0	30	24	18	8	-3
15	19.3	23	15.3	34	26	17	6	-6
16	18.4	24	14.6	34	25	16	3	-11
17	17.5	25	14.0	34	23	13	0	-16
18	16.7	26	12.2	33	21	10	-5	-21
19	15.9	26	10.9	31	18	6	-10	-29
20	14.7	26	10.0	28	13	0	-18	-39
21	13.5	28	9.5	25	9	-6	-28	...
22	13.4	27	9.2	24	7	-8	-30	...
23	13.4	26	9.1	24	7	-8	-30	...
24	13.1	21	9.0	18	4	-10	-30	...

VK WEST USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.1	8	21.0	-12	4	8	8	5
2	22.6	8	17.9	-6	6	8	7	2
3	19.8	8	15.7	0	8	8	4	-3
4	17.8	10	14.1	6	10	7	1	-8
5	16.6	12	13.1	11	11	7	-2	-13
6	15.8	16	12.5	16	13	6	-5	-18
7	15.0	20	11.9	21	14	5	-8	-24
8	14.8	24	11.6	25	15	5	-10	-28
9	14.3	27	11.1	28	15	3	-14	-33
10	13.2	30	10.2	26	12	-2	-22	...
11	11.9	32	9.1	23	6	-11	-34	...
12	12.3	32	9.4	25	8	-8	-30	...
13	15.7	29	12.4	33	21	10	-6	-23
14	15.7	29	12.4	33	21	10	-5	-22
15	15.1	24	11.7	26	17	7	-7	-24
16	14.1	19	10.9	19	12	3	-11	-27
17	14.4	13	11.2	13	9	2	-10	-25
18	13.6	6	10.4	7	5	-1	-13	-27
19	13.0	-1	9.9	2	2	-3	-13	-27
20	13.8	-3	10.5	-2	2	-1	-9	-21
21	16.6	0	13.1	-7	2	2	-2	-10
22	20.5	4	15.7	-13	1	4	3	-1
23	23.5	6	18.4	-16	0	5	6	3
24	25.2	8	20.1	-16	1	6	8	5

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● MASSIVE PRICE REDUCTION. Andrew type 43716 right angle N plug silver plated, super price only $30.00 each suitable for LDF 4-50 cable; Andrew type L45R 7/8" EIA flange connector, super price only $27.00 each suitable for LDF 5-50 cable; Limited quantities Model VC50 cable power divider 50OHMS 400-520MHz cable assembly fitted with N connectors only $40.00 each; UHF antenna stainless steel 15 element 500-520MHz Don't pay $350.00 only $115.00 each Brand New, including brace kit; 7/8" Cellflex cable only $12.00/metre; Coax crimping tool for RG58, RG59, RG62 and pins $16.95 each, save $20.00. Please allow for postage and packing. Jim Rogers, 11 Montreal Ave, Killara NSW 2071. Phone (02) 418 1265 Fax (02) 498 4466.

FOR SALE NSW

● SHACKOUT KENWOOD TS-930S $1500; TS-440S $1500; TS-600 $500; TS-700SP $500; TS-811A $900; TR-7800 $300; TR-9750 $550; TH-21 $100; TR-3500 $200; TL-922 $2000; YK88S/SN $50ea; SW-200 $100; SW-2000 $200; JR-599 $160; COLLINS Equipment KWM-380 $1600; KWM-2A $800; 75S-1 $500; 32S-1 $600; ROTATORS KR-500V $300; CT-1000 $500; ATV TX $200; 1KW LP FIL $45; 2M 100W LIN $120; F/PATCH $30; TNC-2 $150. Plus more all with serial numbers. Sandy VK2AD QTHR (02) 488 9999.

● GALAXY 3 xcvr complete needs slight repair mic manual spare finals $60. Bonus heavy duty power supply. Max VK2GE QTHR (065) 85 5732.

● 572-B (3) G.C swap for pair new 6146, 813 $25; 4CX250 VHF-PA $50; 829-B $25; SSB 40-CH 11m xcvr swap for rotator HY-GAIN TH2 MKII Yagi $100; OLD telephones/meters Pye 5Q pre-war tx. Neville VK2QF QTHR (063) 73 8624.

● COLLINS 30L-1 linear exc condition manual uses 811A valves $900. David VK2OC QTHR (069) 48 5267 after 8pm.

● PORTABLE packet! complete setup including Epson laptop pc with 20mb hard disk. BAYCOM modems and software, KENWOOD TH21 hand held transceiver and Brother HR-5 battery operated printer, all in good order $750.00. Horst VK2HL QTHR (02) 971 9795.

● DECEASED ESTATE VK2CDM KENWOOD TS520 spare finals and driver, DC leads, hand mic, head set, owners manual, KENWOOD AT200 $750 the lot; BC348R Receiver (working) Cir Dia (Offers). Tony VK2CAM (02) 638 3569.

● DECEASED ESTATE VK2YC KENWOOD 120 ATU $120; KENWOOD MC-85 desk mic $120; KENWOOD PC1 phone patch $140; KENWOOD HF whips with bumper mount $150; TWO SIEMENS M-100 teleprinters $25 each. Tony VK2CAM (02) 638 3569.

● YAESU FT101ZD hand mic, mint condition, spare finals and driver $750; YAESU HF whips 2 mtrs to 80, gutter mount $120; HUSTLER HF whips, tow bar mount and 54" mast $135; TWO 6146B's with driver $120. Tony VK2CAM QTHR (02) 638 3569.

● KENWOOD TS820, hand mic, manuals $800. Ron VK2VND QTHR (02) 871 5127.

● TWO NEC TR-400 UHF duplex base stations on 400 MHz, 8 cavity duplexers, xtal ovens, 10 watts, ideal conversion to 70cms for linking or repeater $375. John VK2ATU (02) 792 2275.

● YAESU FC700 antenna tuner $200; YAESU mobile whips $100. Peter VK2CIM QTHR (060) 25 1843.

● COLLINS KWM-2 xcvr $800; S-LINE 75S-1/32S-1 $500; TNC-200 packet board $160; TELEREADER CWR-685A (updated software) $500; SONY ICF-2001 general coverage rx $200; OLIVETTI M24 computer $300. Tom VK2OE (046) 21 2228 evenings.

FOR SALE VIC

● YAESU FT101B vgc spare finals 2 mics h'books $450.00. Norm VK3DOL QTHR (03) 725 4061.

● RACAL RA-17L receiver gc as new service manual $500; YAESU FRG-7 receiver as new service manual $300. G. Himolij, 118 Wilsons Rd, Newcomb, Vic 3219 (052) 48 1410.

● KENWOOD MC-50 $85; YAESU MH-10-E8 for FT290 MkII or FT211 $30; BENELEC ext speaker $15. All in exc cond. Paul VK3EPD (059) 83 1771.

● REALISTIC HTX100 10m SSB/CW mobile radio excellent condition, still in box, plus ZCG mobile antenna $200. Derek VK3DD (03) 730 1557.

● SATELLITE demodulator for Aussat TV RO: NEC 1022A requires simple audio board to be constructed to receive audio, circuit supplied plus LNC $105. N Muscat VK3BCU (03) 390 2609.

● DECEASED ESTATE of VK2AHM. KENWOOD TS930S HF xcvr excellent condition; KENWOOD TS820 HF xcvr; YAESU FL2100B linear amp; KENWOOD 2200G 2 mtr xcvr 1 watt 4 xtals; TH6DX needs reconditioning; 60ft telescopic lattic tower; EMOTATOR 1105MX rotator. All mikes and manuals. Geoff VK3ACZ QTHR (050) 24 5987.

FOR SALE QLD

● CREED Teleprinter model 54, original, complete with dialler/PSU and manual. Best offer for this collector's item; SHURE model 450 desk microphone w/data sheet, v.g.c. $90 or exchange ICOM SM8 desk mike; ARA issue 1 of Vol 1 and many later issues, collector's items, best offer; ICOM IC-730 in g.c. $750; SIDEBAND SE-502 10M base station, with circuit diagram, conversion info and Xtals for reconversion to 11M $100. John VK4SZ QTHR (070) 61 3286.

● DECEASED ESTATE TH3 MK3 three element tribander 10m steel mast CDE rotator controller and transformer buyer to dismantle and remove; Offers please. ICOM 2A 2m with adaptor power supply; TOKYO HYPOWER HL32V amplifier. Graham VK4BGC (07) 359 0109.

● SIG GEN H.P good order covers 10 to 420 MHz $150; YAESU FTDX560 with manual $350. Good goer. Herb VK4KM (071) 64 2202.

● ICOM IC551 6m xcvr, s/n 01270, all mode, inbuilt power supply, handbook, original packaging, mic, 13.8v cable for mobile use $225. Ian VK4KBC QTHR (071) 23 1224 or (071) 29 8237.

● FT767 GX HF 6m, 2m, 70cm, vgc $2700; NATIONAL DR49 comms recvr good performer. Ron VK4BL (070) 55 0230.

● TWO 55ft steel lattice masts complete with guys etc $250 each. Buyer removes. Christine VK4CB QTHR (07) 202 6160.

FOR SALE SA

● TELEREADER CWR 670E with 11" green display tube Sanyo s/n 521168 $250. John VK5XT QTHR (085) 56 5881 after 1600 hours.

● KENWOOD TS430S HF xcvr s/n 3040447 c/w hand mike instr manual original packing, FM board fitted and mobile mount $900. Jeff VK5BJF QTHR (088) 42 2085.

FOR SALE WA

● KENWOOD 940S mint s/n 5110458 $1990; ICOM 725 mint s/n 0011794 warranty $990; ICOM 751A mint s/n 04493 $1380; XYL wants new kitchen! Graham VK6RO QTHR (09) 451 3561.

FOR SALE TAS

● ALINCO 2M HH xcvr DJ-FIT/E s/n 4148, new and hardly used, in original box with instruction manual and cct diagram, paid $430 asking $325 ONO. Frank VK7LO (004) 24 6672.

WANTED ACT

● XFMR HV 1.5kv @ 500MA also LV xfmr 300-350v @ 200MA and or 6.3v @ 2.5A. Ted VK1BL (06) 257 6098 (AH).

WANTED NSW

● EARLY RAF and RAAF air publications and manuals for research project. Don't throw out those old publications! Dig them out now before its too late. Brad Latta, 6/2A Belmont Ave, Wollstonecraft NSW 2065, (02) 250 7468 BH, (02) 438 1985 AH. I will pay your postage.

● ONE SATO 70mm vernier drive second hand or new will pay good price. Graham VK2FA QTHR (049) 54 8688 AH or (049) 61 7236 Phone or Fax.

● 20M Beam. Peter VK2CIM QTHR (060) 25 1843.

WANTED

● ROBOT 400 memory chips, need at least four UPD411D 4k ram chips or substitutes to get my old robot working again. Can anyone help? Brian VK4BCF QTHR (07) 366 4578.

● PHOTOSTAT copy of operating instructions for telereader model CWR 685A. Please state costs. Gordon VK4KAL QTHR (079) 85 4168 prefer 6-8pm.

● ICOM-SM5 in v.g.c. or SM8 desk mike, FL30, FL45 Filters. John VK4SZ QTHR (070) 61 3286.

● THE HERVEY Bay Amateur Radio Club Inc. are looking to purchase a reasonably price Hf antenna either a TH3 mark III or a TH6DX and an Hf amplifier. Both must be in top working condition as it is for the club station. Gray Taylor VK4OH, PO Box 526, Hervey Bay Qld, (071) 25 7167.

● SERVICE manuals (or copies) for Eddystone Rx models 770R and 770U; ROLA tape to tape recorders models 66 MKI and 77 MKIII; REDIFON RX model 145/SSB all costs reimbursed. Christine VK4CB QTHR (07) 202 6160.

WANTED WA

● INTRUDER WATCH observers in VK6. Please help, free postage, logs, envelopes, advice. Our Division supports intruder watch. Please support us. Thank you. Graham VK6RO Co-ordinator for WA QTHR (09) 451 3561.

WANTED TAS

● PAN adaptor circuit for Kenwood TS 930 Mark 2; EK-101 electronic keyer will not work over 22 wpm. CAN ANYONE ADVISE ME HOW TO ADJUST THE 6 adjustment points. Gerry Visser VK7DQ, 10 Maranda Rd, Kingston Tas 7050.

MISCELLANEOUS

● DX-ERS Special Issue QSLs and Commemorative QSLs needed for WIA QSL collection, but all your cards are welcome. Can you help? Contact Ken VK3TL, 4 Sunrise Hill Rd, Montrose Vic 3765 or (03) 728 5350.

ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.

*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.

Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

ADVERTISERS INDEX OCTOBER 1993

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

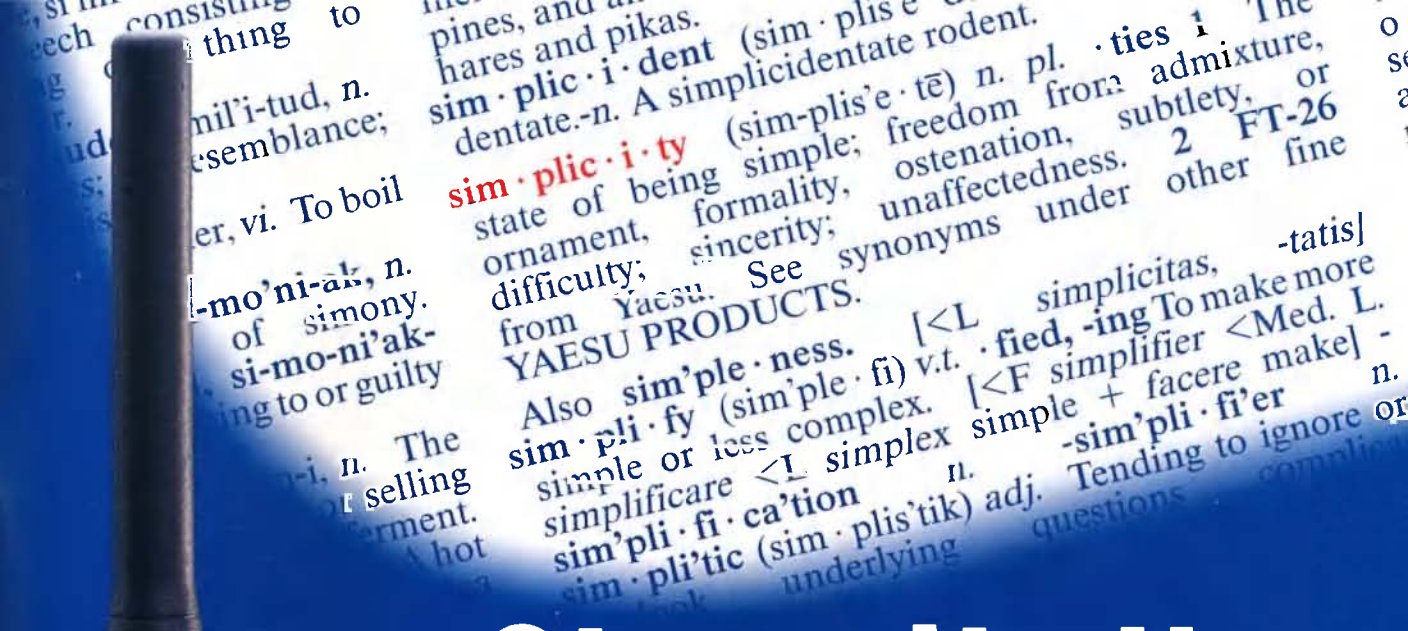
VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz



Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

A simply brilliant price

$449

Cat D-3600

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

Ham heaven.

Some days Duncan thinks that he must have died and gone to heaven. Whichever way he turns he is surrounded by the finest ham radios around. What's a guy to do? He plays with them all day. And if that wasn't good enough, he gets paid for it as well.

Duncan Baxter... well VK 3LZ actually, let's call him by his 'real' name, is our resident ham radio expert. No one knows the Icom range better than VK 3LZ. He's been with us virtually from the start, some ten years in fact.

Now, if you'd like to find out about the latest in transceivers, or virtually anything else to do with amateur radio operation, why not give VK 3LZ a call. Or you could simply drop in and see him at ham heaven ... err ... our head office that is.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call: (008) 338 915 Ph: (03) 529 7582 Fax: (03) 529 8485 A.C.N. 006 092 575

LL BROWN ADVERTISING 4506

AMATEUR RADIO

NOVEMBER 1993
Volume 61 No 11

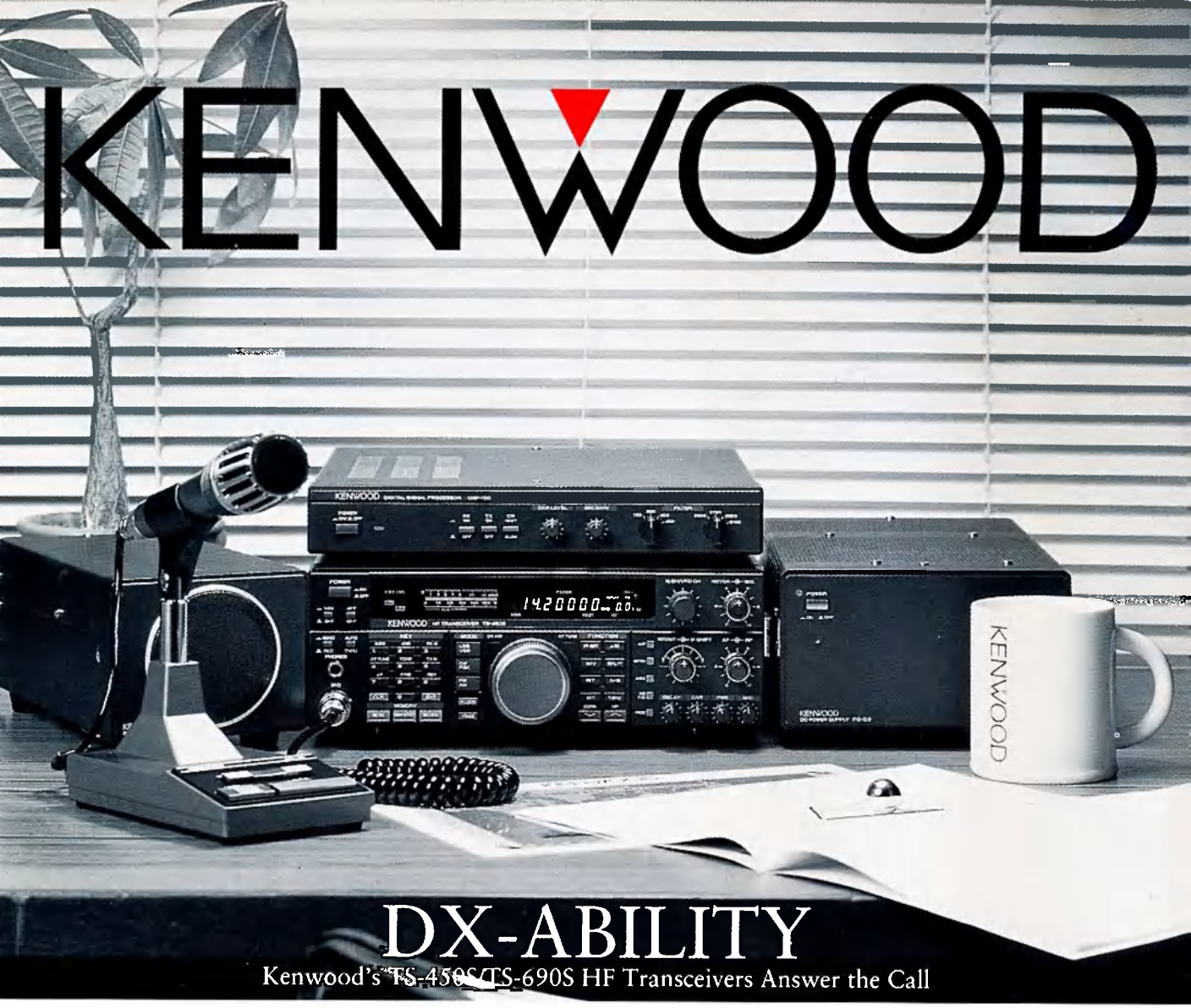
Journal of the Wireless Institute of Australia

IN THIS ISSUE:

A simple 300/1200 Baud-Packet-Radio-Modem
Make your SSB Signal Sound Better
An Effective Junk Box Crowbar

and lots more

KENWOOD



DX-ABILITY

Kenwood's TS-450S/TS-690S HF Transceivers Answer the Call

Wherever you are, whatever the situation, you can always count on Kenwood's TS-450S and TS-690S for tough, dependable performance. Products of world-famous Kenwood engineering, these versatile HF transceivers are designed for SSB, CW, AM, FM and FSK modes of operation on all Amateur bands, including the WARC bands. To further enhance capabilities, choose the optional DSP-100 Digital Signal Processor. The AT-450 Automatic Antenna Tuner is built into the TS-450S, and is available as an internal option for the TS-690S. Along with multi-function operation and the highest levels of quality and performance, both models offer yet another advantage: ultra-compact dimensions ideal for DXpeditions and mobile use.

Enjoy all the advantages of these superior features:

■ Superior receiver dynamic range of 108dB ■ Kenwood's exclusive AIP (Advanced Intercept Point) system ■ General coverage receiver ■ Automatic antenna tuner (TS-450S only) ■ Inbuilt automatic ATU option (TS-690S only) ■ Ultra-compact design ■ Excellent split frequency operation ■ CW pitch and CW reverse mode selection ■ Digital bar meter and multi-function LCD display ■ IF shift circuit ■ Dual-mode noise blanker (pulse or 'woodpecker') ■ 1Hz fine tuning ■ 100 memory channels ■ 100 watts output on all HF bands ■ 50 watts output on 50 to 54 MHz six metre band (TS-690S only)

HF TRANSCEIVER **TS-450S/TS-690S** HF TRANSCEIVER

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(INCORPORATED IN N.S.W.)

8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140
Phone (02) 746 1519, (02) 746 1888, Fax (02) 746 1509
Call now for further information and the name of your nearest authorised Kenwood dealer.

Kenwood Electronics Australia Pty Ltd only warrants products purchased from their authorised Australian dealers.

Please phone, mail or fax for information
Name.....
Address.....
..... Postcode.....
Publication..... Issue .....
Model.....

AMATEUR RADIO

Journal of the Wireless Institute of Australia

Vol 61 No 11 ISSN 0002-6859 November 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191
Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
December	08/11/93	10/11/93
January	29/11/93	01/12/93
February	10/01/94	12/01/94

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

Gwen Tilson VK3DYL with her "second op" Rocky and some of her thousands of DXCC cards as a backdrop. Gwen's thumbnail biography appears on page 32.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

Federal Secretary
Bruce Thorne
Office Manager
Donna Reiily

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Federal QSP

Once upon a time there was a land where the people lived happy and contented. Food was plentiful, climate was ideal and it rained when needed. Heart disease, high cholesterol levels, work stress was unknown. But all that changed overnight.

Into this community moved, horror upon horrors, an AMATEUR RADIO OPERATOR. Leaving aside consideration of his wonderful family, his sober habits, immaculate lawns, participating in school fund raising, and his ready assistance to some senior citizens as a handyman whenever required, he actually asked his neighbours if they would mind the erection of a RADIO MAST on his property.

Within a very short time, so many objections were raised against this infernal, aesthetically displeasing, cancer causing radiator, a device which depreciates adjacent land and home values, that he had severe misgivings about the whole community and their attitudes to life.

Pondering on the problem, he asked several questions of his neighbours. Results staggered him. Practically all said they had NO knowledge of amateur radio. Some knew of the Scout Jamboree. One parent even said her son spent a weekend in an adjoining community. He had enjoyed himself and learned some funny expressions like "What is your QTH", and announced that he was going to become a ham as soon as he learned some radio theory and "the code". Two neighbours knew that any radio transmissions were harmful to children!

Well, now he knew the magnitude of his tasks. How to educate the community so they could make a valued judgement on amateur radio. So down through the age groups his programs of education would be given. But where? How? When? (He knew why).

So with BBQs, evening classes at the local senior citizens club and even establishing a school evening class, all at his cost, he made the community aware of amateur radio.

Weeks turned into months and finally two years later he thought it might be time to ask about his radio mast again. Which he did.

Years pass by, community values change — business and making a buck — electronic apparatus of all kinds invade the home — council bylaws control everything — except in circumstances where the real big dollar is seen to dominate. Telecom and OPTUS erect Towers. High voltage pylons arch across and through the suburbs, solar water heaters and AIRCON units appear on home roofs. Two storey homes appear, and the occasional satellite dish is seen. Marine craft are moored on street verges, along with sundry trailers and caravans.

The neighbour up the street leaves at 6 am in his 10 tonne truck which certainly doesn't like starting, let alone grinding its way up the hill. At least he is regular, you can then lie awake waiting for your alarm to go off a little later.

And into this area moves a new amateur, knowing he must do everything correctly. He applies to the council for a building permit to erect his 6 (yes 6) metre mast. What do

you think the answer from the council would be, and on what grounds?

You were wrong! Council wouldn't approve because the electricity supply authority had put the power reticulation to the homes in his area underground.

If you have been looking for a moral, or how to get council approval, sorry. As our numbers stand, the figure is 1 in 1000 population. However, most of the applications to erect a radio mast (not tower), seem to succeed. Enlist the aid of those who have been through it all, seek help from your local radio club and WIA. Above all have some dialogue with your neighbours (does he/she like Guinness, Johnny Walker, unleaded, leaded, or ultra high strength ale?).

There seems to be no solution to the neighbour who admits amateur radio is a great hobby, his sons enjoy JOTA, thinks the local radio club participation in search and rescue commendable, but says no to your need to erect a mast.

Because it will cause TVI, and that is the end of it.

This hasn't been the usual type of QSP. It wasn't intended to be.

If past and present accomplishments of amateurs/hams are looked at and acknowledged then we should be able to conquer our problems, whatever they may be.

Like retaining our membership.

Neil Penfold VK6NE
Federal Vice President
ar

Editor's Comment

Divisions

You may not have noticed its absence, but this is the first "Editor's Comment" since last March. There has been a "Federal QSP" to keep the flag flying in the meantime, but your humble editor has refrained from "comment" for seven whole months!

It has now been decided that both a *Federal QSP* and an *Editor's Comment* will appear from now on, so my little holiday is over! Of course, the magazine has kept me rather well occupied in other ways in the

Continued on page 51

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts		1993 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Roger Harrison Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2ZTB	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Halley Tue & Thur 0830-1530	VK3PC VK3XV VK3XLZ	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

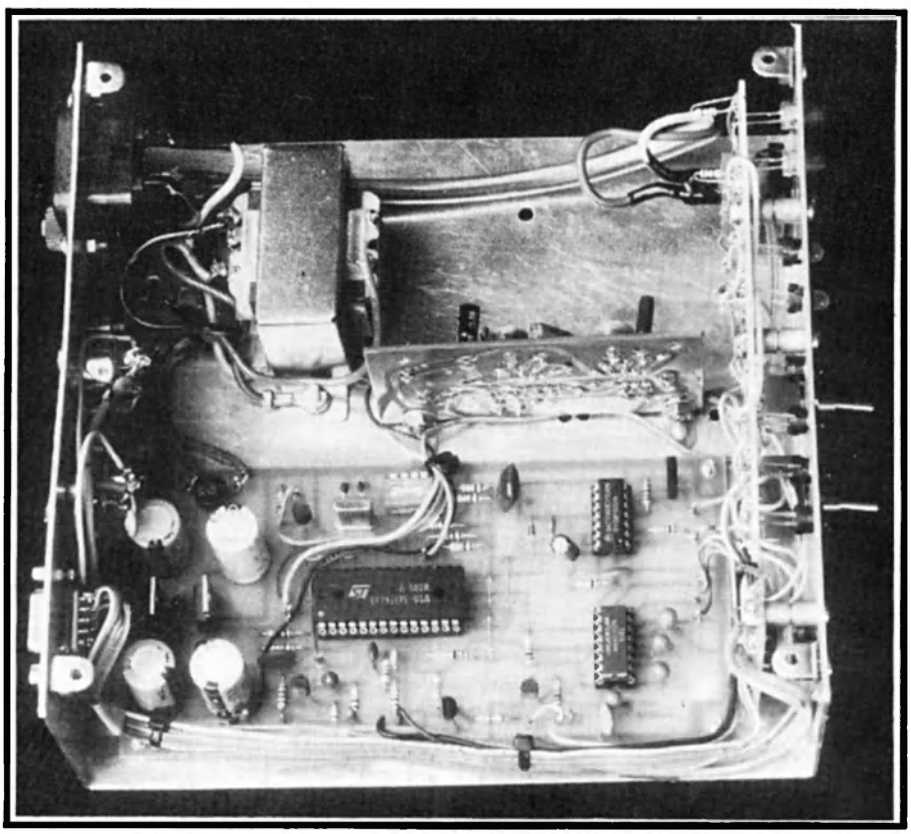
Three-year membership available to (F) (G) (X) grades at fee x 3 times.

A Simple 300/1200 Baud Packet Radio Modem

*Lou Destefano VK3AQZ * after an unusual introduction to Packet Radio, now solves another problem.*

Just recently, I purchased the Pocket modem designed by Tom Moffat. This is a software TNC using Baycom or similar software and operating at 1200 baud. This baud rate is satisfactory for 28 MHz and above but not for HF packet. Although the Pocket modem is excellent for its intended application, it cannot be made to work at 300 baud. The TCM3105 chip can handle just about any baud rate, except 300. However there is a chip readily available that can handle 300 as well as 1200 baud. This is the AMD 7910 world-chip which can be programmed for Bell 103, Bell 202, V.21 and V.23. The disadvantage of this chip is the requirement for a + and — 5 volt supply and the rather heavy current consumption of around 150 mA.

The circuit diagram of a dual baud rate modem using this chip is shown in Figure 1. The design is nothing really original and the basic circuitry is very similar to the TCM3105 modems such as Baycom, Poor Man's Packet, Moffat's, and a variety of other published circuits including ones using the 7910 chip. Most of the hard design work has been done by the chip manufacturer and there is only limited circuit variation possible external to the chip. The purpose of this article is to introduce to the reader, a software TNC modem suitable for both HF and VHF packet radio.



Side View of Modem showing main PCB, tuning indicator board, and rear of front panel.

Circuit description

The 7910 modem chip is capable of receiving and transmitting FSK audio tones for a variety of modes which can be selected by applying the appropriate logic level at inputs MC0 to MC4 (pins 17 to 21). It can also be programmed for "loopback" mode. When using Bell 103 mode, the transmitted data is sent using one pair of audio tones whilst the received data uses a second pair of tones. If the sending modem is in the "Originate" mode, a space generates a 1070 Hz tone and a mark, a 1270 Hz tone. A modem in the "Answer" mode will reply with 2025 Hz for a space, and 2225 Hz for a mark. This enables duplex operation over a phone line. For amateur packet operation, the same pair of tones are used for both transmit and receive. Fortunately, the 7910 is able to transmit and receive on the same pair of tones at 300 baud by using the "loopback" mode, which was incorporated in the chip for test purposes. Loopback is selected by a logic high on pin 21 (MC4 input).

Bell 202 mode (1200 baud), uses the same tone pairs for transmit and receive with a back channel at 5 baud for the reply. An SPST switch wired to pin 18 of the 7910 selects either 300 baud or 1200 baud mode. The other 4 pins are programmed with a 4 pole dip switch on the pcb. If you prefer, this switch can be left out and wire links used instead. However, if you leave the switch in, you can experiment with some of the other modes. These are briefly described on the circuit drawing . For those interested, more information is detailed in the manufacturer's data sheets.

Input/Output Circuits

The received audio tones are fed into the modem via DIN sockets from the HF and VHF rigs. A set of small trimpots is used to adjust the receive and transmit tone levels. These trimpots are located on a small piece of matrix board mounted behind the front panel with small LED plastic bezels for neatness, and as screwdriver guides. In my set-up, audio from the HF rig (IC720A) is taken from the multiway connector at the rear and is independent of the front panel volume control. The

transmit audio also enters the rig via the rear connector but still utilises the front panel Mic gain. The HF TX trimpot is set so that the transmitted power is roughly correct with the Mic gain control at the same setting as for voice. This modem transmits packet data as audio FSK and is fed into the transmitter audio input circuits. This method of transmitting FSK has limitations in that over-driving the audio input can generate unacceptable distortion products.

The setting of the transmit audio level needs to be carefully done by listening on another receiver, and ensuring the transmitted tones are relatively clean. Do not overdrive the rig in an attempt to get more apparent power, and definitely do not use a compressor. Use of an RTTY input, which directly controls an oscillator frequency, is a much better way of transmitting packet data. For packet operation, the frequency shift of this RTTY facility should, in theory, be reset for 200 Hz shift.

The audio take-off point at the rear connector of the IC720A has a relatively high impedance necessitating a 10 k trimpot for VR2 to minimise the loading. For the VHF rig, the audio is derived from the speaker output. As for HF, the transmit audio tones are fed into the Mic input. VR3 is used to adjust the TX tone level and is set for a reasonable level of tone modulation without going into too much clipping.

Use of an RTTY input, which directly controls an oscillator frequency, is a much better way of transmitting packet data.

In this case, the setting is not as critical as for the HF rig. Listening on a second rig whilst adjusting VR3 will give you a good idea of the quality.

The selection between HF and VHF is made via S1a, b, and c. As 1200 baud is also used on 28 MHz, the 1200/300 baud selection could not be incorporated into this switch if full versatility was to be maintained. For receiving packet tones, the appropriately selected audio is fed into a small 10 times amplifier so as to increase the level up to around 200 mV RMS. This amplifier stage is really only needed for the IC720A, which only gives 50 mV from the rear connector. On the other hand, the VHF rig speaker output supplies plenty of signal and may be too high if the receiver volume control is wound up.

This transistor amplifier also feeds a simple tuning indicator which I have incorporated into the modem. This indicator is only needed for HF packet. It is an essential addition if you want to spare yourself the pain of trying to tune in HF packet signals without one. The received tone frequencies for HF packet have to be tuned very accurately. The difference in frequency between the two tones is only 200 Hz and the exact tones are very difficult to pick by ear. If you alter the receive tuning during the short packet burst, you will not receive an output from your packet display. As the bursts are short and random, it can take considerable time before you fluke a correct decode.

The tuning indicator I used is one designed by Garry Cratt and was published in Silicon Chip, April 91. It uses a pair of NE567 tone decoders each driving an LED. The NE567 is a PLL tone decoder and can be set up as a very selective tone detector. In this design, one chip is set for the space tone, whilst the other is set for the mark tone. The bandwidth of these detectors is very narrow resulting in an accurate packet tuning indicator. In operation, the rig is carefully tuned (in 10 Hz increments if possible) until both LEDS flash with packet data. If you intend using this design, I would strongly recommend the use of small 10 turn trimpots, or resistive padding, for setting the tone detector frequencies. The single turn trimpots are a little too touchy for the close spaced packet tones. The audio level required to drive this indicator is at least 200 mV RMS.

With regards to the reception of packet data by the modem, the software I am using waits for the activity on the data receive line to stop before it starts to send data out. On VHF, this occurs once the squelch operates and mutes the audio out of the rig. This in turn quietens the receive data line and the software knows it can send if required. On HF, there is no receiver squelch as such, and the "okay to send" is actually initiated from an absence of audio. Unfortunately, on HF, there is plenty of noise and QRM which causes the software to think that the channel is busy. The carrier detect circuit in the 7910 indicates a busy channel with a moderate level of noise.

In order to work successfully on HF, I have found it necessary to turn the RF/IF gain control down so that the packet data is recovered but the noise is low enough to allow transmission. Adjusting the pass band tuning also helps significantly. The modem really needs a packet detection system that ignores the noise and QRM. Some of the commercial units use an XR2211 as a PLL detector which then acts as a form of squelch if the correct tones are not received. In my particular modem, I have noticed that the tuning indicator LEDS do not come on very easily with noise alone. It really needs valid audio tone for the LEDS to come on. Although at this stage I have not tried it, it may be possible to derive a squelch type signal from the tune indicator output LEDS. This squelch could drive a transistor switch across the wire sending data to the computer.

As each LED flashes alternatively depending on whether it is receiving a space or mark tone, a one bit delay is needed. The voltages driving the two LEDS would then be "OR-ed" together, inverted, and applied to the squelch transistor. As most of the circuitry is already in the modem for this form of carrier detect system, it would be relatively easy to implement. An interesting article on this problem has been written by Eric S Gustafson, N7CL, presented as one of the papers at the 7th Computer Networking Conference published by the ARRL.

The Computer Interface

The 7910 is driven by the computer via an RS232 interface chip. The particular software I am using is Graphic packet which is written for an IBM PC, or compatible, and makes use of the serial RS232 ports. Other software is available which can connect to a Commodore computer, or use the parallel interface. In my case, I am catering for an RS232 serial port, and thus I have used the versatile MAX232 chip. This chip has two TTL to RS232 converters plus two RS232 to TTL converters. In addition, it operates from a single 5 volt supply and internally generates + and — 12 volt RS232 signals. Alternative drivers are the 1488/89 chips but these require dual supplies, as well as stabilising capacitors. The single MAX chip does it all in one hit.

Some of the TCM3105 designs use standard MOS chips with high value series resistors to overcome the problem of blowing the chips up with the negative RS232 voltage swings. That's fine for short leads but unsuitable for longer cables and HF where high power rf can enter the connecting cables. The MAX chips have much lower input impedance and are thus more immune to interference. Whilst talking about HF applications, because of the powers involved, and the sensitive receive requirements, the use of well shielded leads and a metal box is a must.

The MAX chip drives the computer via a DE9S (Female) connector and uses the same pin numbers as the Moffat modem for compatibility. If your computer uses a 25 pin serial port connector please note that the function of the pins in the DE9 is not standard. If you purchase a standard 9 pin to 25 pin adapter or cable, you will have to rewire the cable. The connections are shown below :-

Note: The power function on pin 3 is only used in the Pocket Packet modem.

Function	DE9	DB25	Normal use
Tx Data	4	20	DTR
Rx Data	8	5	CTS
Ptt	7	4	RTS
Gnd	5	7	
Power	3	2	TXD

WIA News

Good publicity for amateur radio

It always pays to publicise your club's activities, and keeping in contact with the local newspapers in your club's area can pay dividends.

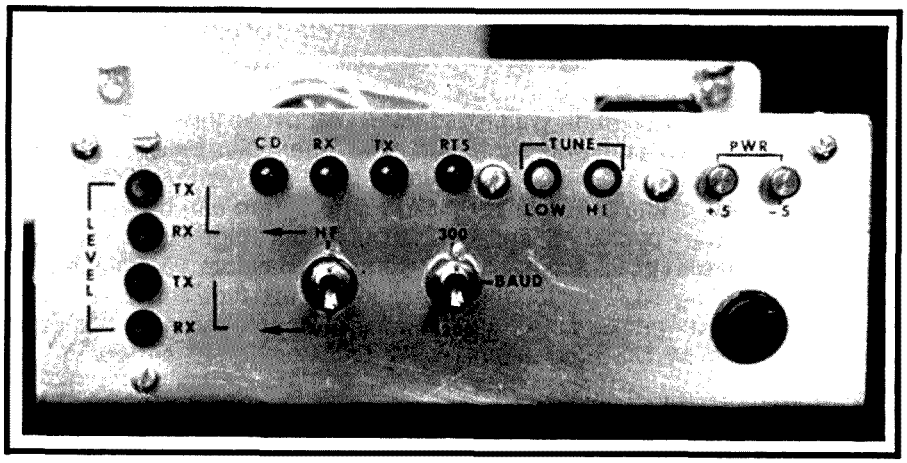
In August, when the Glen Innes and District (NSW) Amateur Radio Club opened its new headquarters at the town's railway station, the *Glen Innes Examiner* went along.

The result was a charming picture in the paper the next week and a short, complementary story about the club and the hobby of amateur radio.

The picture showed foundation member, Ivan Botha, with his wife and baby daughter with the amateur equipment at the club's new headquarters.

Well done, Glen Innes and District Amateur Radio Club.

Such publicity keeps the hobby of amateur radio regularly before the public and helps dispel the many myths that abound about the hobby as well as to distinguish hams from CBers.



Front view of Packet Radio Modem.

In addition to the interface chip, a watchdog timer circuit is included to shut the transmitter down should a fault develop during unattended operation. This circuit is similar to other designs and works quite well. In some designs, an additional muting circuit is applied across the transmit audio output of the 7910 (pin 8). This muting is applied at the end of the packet data stream or when the watchdog timer activates. The rest of the circuit contains a simple dual supply and some LED indicators which display various modem conditions. Apart from the vital tuning indicator LEDS for HF packet, the rest of the LEDS can really be left out if you wish. If you decide to incorporate them, the LEDS flash away quite nicely during operation and can be entertaining to watch if nothing interesting is coming through on the screen.

With regards to the power transformer, I used a low cost ($4) unit from Radio Parts rated at 300 mA. The particular *unit* I purchased was a multi-tap one but it did not have a centre tap at the voltage I wanted. However in this application it does not matter too much. If you are able to, it would be better if you could use a 9 V — 0 — 9 V transformer.

Software Considerations

The modem uses software which performs the TNC functions as well as the terminal facility. I have been using Graphic Packet (V1.21) by Ulf Saran (DH1DAE) which makes use of attractive icons, and is very user friendly. Graphic Packet uses a TNC program called TFPCX by Ren Stange Y51GE. This software has been put in the public domain by the writers for use by amateurs, providing no commercial gain is made. All this software is for use with an IBM PC. I am using a 386 computer but the software can be used on a 286 and an XT. I have not tried it on an XT so I cannot comment on its use here. Other software, such as Baycom and SP, can also be used. SP and Baycom have a more basic screen display and appear very similar to each other. SP also uses the TFPCX software for the TNC function.

An important requirement of the software is the ability to configure it for both 300 baud and 1200 baud. I have both GP and SP working at both baud rates very successfully. Baycom V1.5 can be made to work at 300 baud by using the TNC command": HBAUD 300" after loading Baycom.

With regards to GP, I have two configuration files. One is set up for 1200 baud and I have named it CON1200.GP. The other is set up for 300 baud and is named CON300.GP. I boot up GP via a small batch file, and again I have two of these.

The 300 baud batch file is called GO300.BAT and the first line does a file copy from the 300 baud config file into CONFIG.GP, which is the file name GP looks for when it starts. The next line of the batch file does the same thing with the TFPCX part of the software which also needs to be configured according to the baud rate, as well as cater for some slight differences in TNC parameters. When working HF packet, some TNC parameters such as the TX delay time, the number of retries, and so on, need to be fine tuned. Having two separate configuration files allows you to experiment with these parameters.

At this stage I must say I am still learning about HF packet and my set-up is probably not right yet. In addition to the copying of the specific configuration files, the batch file then loads the TFPCX software. When loading TFPCX, you can specify certain parameters such as which comms port you are using, the baud rate, and a switch which tells it to look for a specific initialisation file called TFPCX.INI. The next line then loads the Graphic packet running file called GP286.

For XT computers I believe you load GP in lieu of GP286. The last line of the batch file unloads TFPCX from memory after you exit GP. TFPCX resides in about 40k of RAM and runs in the background. In fact, with GP, you can exit to DOS via GP's DOS exit icon, and carry out other tasks on the computer whilst GP looks after any packet traffic.

For illustration, the 300 baud and 1200 baud "GO.BAT" files are shown below:-

```
   GO300.BAT
   Copy Con300.gp Config.gp
   Copy Tfpcx300.ini Tfpcx.ini
   Tfpcx -pcom2 -b300 -f
   GP286
   Tfpcx -u
GO1200.BAT
   Copy Con1200.gp Config.gp
   Copy Tfpcx120.ini Tfpcx.ini
   Tfpcx -pcom2 -b1200 -f
   GP286
   Tfpcx -u
```

The TFPCX initialisation files are as follows:-

```
TFPCX300.INI
   ^T 100
   ^VK3AQZ
   ^F 5
   ^Y 5
TFPCX120.INI
   ^T 100
   ^R 1
   ^I VK3AQZ
```

In the TFPCX.INI files, the " ^ " is interpreted as an escape character and is used to signify a TNC command. "T" is the parameter for TX delay, and in my case is 100 msec. "I" sets up your callsign. "R" turns on the digipeater function. "F" is the

delay time for an answer in seconds, whilst "Y" specifies the maximum number of connect tries (default is usually 10). There are many other parameters you can play with. I am still learning in this area and have only scratched the surface.

When selecting either 300 or 1200 baud, it may be possible to do this from within GP itself. At this stage I have used the easy way out as above. The GP software is still a bit of a mystery to me. Up to just recently, the only documentation I had for GP was in German. I have to say that in the last month or so I think I learnt to read a significant number of German words! It's amazing how quickly you learn when you have to — particularly when your packet station automatically sends connect text or the "help" list in German! The ability to run both baud rates simultaneously with two comms ports, and dual modems would allow HF/VHF digipeating which I guess is something to aim for in future.

With regards to the English translation, we need to thank Waldis Jirgens, VK2DXV for converting the 40 or so pages into English. A "7PLUS" version of this document is on some of the packet bulletin boards. 7PLUS is an intelligent ASCII to binary encoding scheme for the transfer of files over packet networks and was written by DG1BBQ (also public domain for amateurs). It has the facility to correct for transmission errors and generate correction files which can be sent back to the source for re-transmission of just the missing bits. GP has an automatic 7PLUS file transfer system built in. Please note, however, that you need the 7PLUS program to convert the file back to its original condition. This 7PLUS program is not included with GP.

One thing I have not been able to do with either SP or GP, is down load "EXE", "ZIP" or other binary files on the bulletin boards. On reading the English documentation, it appears that GP cannot do this, although it will transfer binary files between stations using GP. I believe the B-YAPP (not YAPPB) program can be used to do this but at this stage I can only make it work with Baycom 1.5. Please note that normal text files and mail can be read and saved using the GP text save facility.

Construction

The construction of the unit is straightforward. I originally built it "rat's nest" style on an old 7910 modem board designed for phone lines and it worked okay. I don't believe the layout is very critical and it could probably be built on matrix board. I have built mine on a single sided pc board using the Protel software to lay it out. There are only

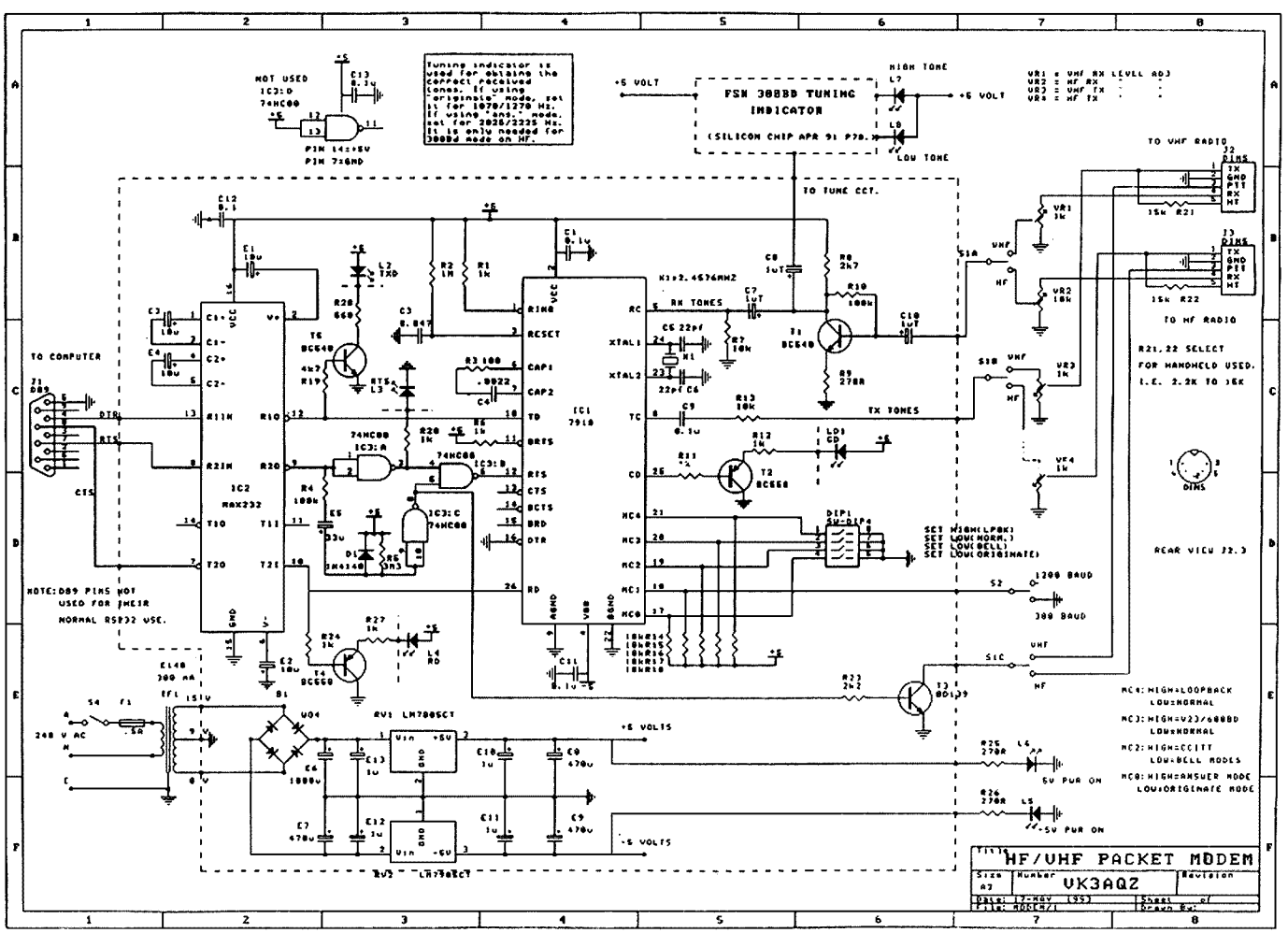


Figure 1 — Schematic Diagram, HF/UHF Packet Modem.

three links on the top and the in/out pins were placed around the board where it suited. Take careful note of the orientation of the electrolytic capacitors around the MAX chip. If anyone would like a Protel PCB file, I can supply it, providing you send sufficient to cover postage and disc costs.

The case must be metal and earthed to reduce interference. Mine is made out of 2 pieces of 16 gauge aluminium bent as matching upper and lower "U" pieces. Size is 7" by 7" by 2.5" high (180 × 180 x 64 mm). I placed a couple of 0.001 μF ceramic disc capacitors from the TX audio pins of J2 and J3 to earth as a precaution against RF feedback. Ferrite beads were also put over the wires joining these pins. Also, some handheld radios use a resistor to ground from the TX audio input to activate the PTT. These can be wired to the rear of J2 and J3 for convenience. To use these resistors, you need to join pins 5 and 3 in the mating plugs. This joins the PTT output from T3 to the bottom of the resistor only when the appropriate cable is plugged in. I use an FT470 and found that 2.7 k is required. I have shown these resistors on both sockets which allows you to use the HF socket for a handheld on 70 cm. Motherhood statement — don't leave out the mains fuse, wire the mains correctly to the switch, and use plenty of heatshrink for safety. Do not use a power cord without an earth if you use an all-metal box.

The tuning indicator is powered from the +5 volt rail. Referring to the original Silicon Chip article, the 8.2 V zeners are left out and the 120 ohm series supply resistors are reduced to 27 ohm. The input coupling capacitor is increased to a 1 μF tantalum.

Alignment

The alignment of the modem is relatively easy. The receive levels into the 7910 are set with VR1 for the VHF rig and VR2 for the HF rig. Starting with the VHF circuit first, set the rig's volume control at about the level you normally use for voice, and with the trimpot wound right down, slowly bring it up until the software starts to decode packet reliably. Once you find this spot, you can turn VR1 up a little more and leave it. Do some tests with noisy signals and see how well it can decode. I found the 7910 very good under noisy conditions and it seemed to be better than the TCM3105. The application notes for the 7910 indicate that the receive circuits contain both analogue and digital filtering. In addition, on 1200 baud, it contains an inbuilt equaliser which can be activated by putting MC0 at logic high. This pin has a dual role.

The alignment of the modem is relatively easy.

When 1200 baud is selected, setting it high turns a receive equaliser on. In the 300 baud mode, it selects whether you are in originate or answer mode. I did not find much difference between equaliser on or off so I have not used that facility. However the difference between originate and answer at 300 baud is very significant as it determines the tone frequencies.

Aligning the HF receive is more difficult as it requires you to have tuned the rig to the correct tones. To start with, set VR2 sufficiently high to activate the carrier detect LED. Then, using the tune indicator circuit, tune carefully till you obtain a correct decode. Once you find the correct receive frequency for the signals, adjust VR2 up and down, noting the point at which the signal will no longer decode correctly. The 7910 is able to withstand a reasonable level of input signal, so once you have sufficient for decoding, you can advance it somewhat higher.

The tune indicator works at its best when it is fed with at least 200 mV rms and so this needs to be considered when setting VR2. The alignment of the tune indicator is as per the Silicon Chip article. Briefly, the trimpots for each NE567 are set with a frequency counter on pin 5 of the NE567's and the 22 k trimpots are then adjusted for the mark and space tone frequencies (with no input signal applied). The tone frequencies you adjust for depend on whether you use "originate" or "answer" mode.

When tuning in a packet signal, or any FSK signal with a sideband receiver, the resulting audio output frequencies will depend on the beat between the BFO and the incoming signals which represent the mark and the space RF carriers. If an SSB transmitter is fed with audio tones from a modem set up for originate, it will receive into its Mic circuit a 1070 Hz for a space and 1270 Hz for a mark. If the transmitter dial is set at exactly 14.100 MHz, then this frequency represents the frequency of the suppressed carrier. If the mode of the transceiver is lower sideband, then only the lower sideband components of the modulation will be output (due to the sideband filter).

This means the modem audio tones for originate mode would appear at 1070 Hz (space) and 1270 Hz (mark) below 14.100 MHz. Similarly, if the upper sideband mode is selected, the tones will be correspondingly above the nominal

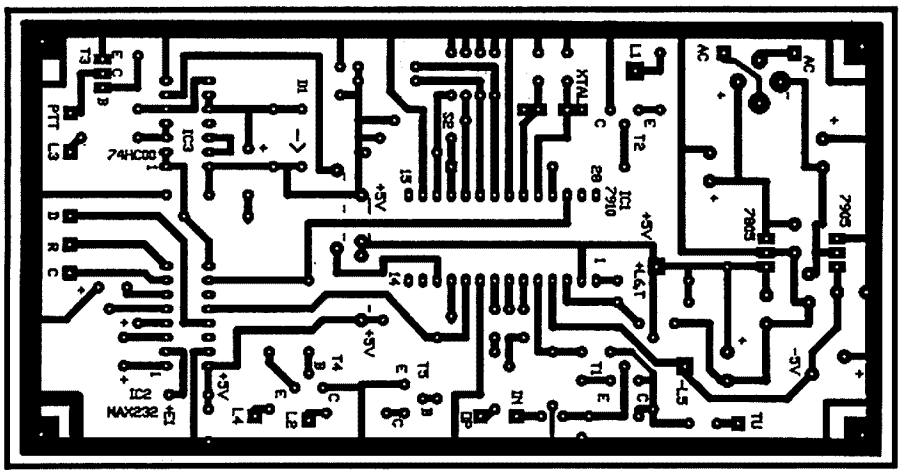


Figure 2 — Modem bottom layer, copper side view.

14.100 MHz carrier frequency. In both cases there will be two signals radiated which alternate on and off and are 200 Hz apart. Their absolute frequency depends on whether USB or LSB is used. Therefore, in the above example, we will have, whenever a space is sent, a signal at 14.100 MHz minus 1070 Hz, and when a mark is sent, a signal 1270 Hz below 14.100 MHz. A bit like two CW signals that are taking it in turn and 200 Hz apart.

If a receiver now comes across these two signals, and it is switched to the LSB mode, the frequencies that appear at the audio output of the receiver depend on the beat between the BFO and the two signals. When the tuning dial of this receiver reads exactly 14.100 MHz, the tones will be as above. If, however, the tuning dial is set at 14.101 MHz (ie 1 kHz higher), the tones will also be 1 kHz higher and appear as 2070 Hz and 2270 Hz. If the receiver happens to have a modem on the end of it which is switched to the answer mode, the two frequencies received are almost the same as those used for 300 baud in the answer mode and will thus decode as valid marks and spaces. In fact, at exactly 955 Hz above 14.100 MHz, the correct tones for 300 baud "answer" mode will result (ie 2025 Hz for a SPACE and 2225 Hz for a MARK).

Taking it a step further, if the operator of this receiver now switches his modem to originate mode, he will no longer decode the packet data whilst he is tuned to 14.100955 MHz. If he now re-tunes his receiver down by 955 Hz to 14.100 MHz, he will again begin to decode the data correctly. So, in essence, it does not really matter if you are in originate mode or answer mode when receiving packet providing you understand how to read your tuning dial and adjust accordingly.

The essential thing is that the BFO beats with the incoming signal to produce the correct tones for the modem setting. A similar effect happens if the receiver in the above example is switched to USB. In this case the space and mark tones will be reversed and the dial reading, which represents the suppressed carrier frequency, will read lower than 14.100 MHz by the amount of the higher tone frequency (which decodes as the lower tone, if you follow!).

If you draw the above out as a spectrum representation showing the suppressed carriers, it will all become clear — I hope!. I understand that the convention on the 20 m band is to use LSB. In my case I have elected to use the modem in the originate mode which means that the audio tones are 1070 Hz and 1270 Hz. This means my tuning indicator has the two tone detectors set for responding to these two tones. So if the tune LEDS are flashing I know I am receiving 1070 Hz and 1270 Hz.

I don't take much notice of the tuning dial (other than to make sure I am in band), but I do know it is reading correctly if the sending station is using originate tones, and 955 Hz low if they are using answer tones. The important thing is the 200 Hz difference, not the absolute frequency values. This effect, if you can call it that, is a result of using single sideband radio equipment, and is not applicable to telephone baseband usage.

In my particular case, I am using the originate mode as the tone frequencies are lower and thus more easily handled by the narrower SSB filter in the rig.

The transmitter alignment is fairly straight forward. The correct tones are automatically generated on transmit by the 7910, depending on the chosen mode. With the pocket modem software, there was a very handy alignment program which generates spaces, marks, or reversals. Using this program, I was able to set the levels into the two rigs whilst listening on another receiver. The transmitters are feeding dummy loads during this process. It can also test if the watchdog timer is working as well as the PTT circuit.

The modem can also be checked and aligned at the computer connector (J1). First put a logic high on the PTT activating circuit. This is pin 7 on J1 and is called RTS. I did this by taking this pin to +5 volts via a small switch. The switch is needed to reset the watchdog timer which turns things off after 30 seconds or so. Strictly speaking, logic high at J1 should really be +12 volts as we are dealing with RS232 levels here. However, +5 seems to work today.

Pin 4 of J1 (DTR) is the pin which takes transmitted data from the computer and feeds it to the modem for generating the transmit audio tones. We need to check that RS232 highs and lows produce the correct tones. A logic low on pin 10 (TD) of the 7910 generates a space tone whilst a logic high generates a mark tone. Between J1 and pin 10 of the 7910 there is a logic inverter, which is one of the buffers in the MAX chip. Therefore, the logic at J1 pin 4 is reversed. During operation the software takes this reversal into account.

So, bearing in mind the above, if you put +5 volts on pin 4 of J1, you should obtain at pin 8 of the 7910 the tone for a space and for a logic low (−5v), the mark tone. The frequency of the tones depend on whether you

are using the answer or originate modes. In the originate mode you should get 1270 Hz for −5 V and 1070 Hz for +5v, and in the answer mode you should get 2225 Hz for −5 V and 2025 Hz for +5v. For 1200 baud mode you should get 1200 Hz for −5 V and 2200 Hz for +5 V with no difference between originate and answer.

Addendum

The foregoing packet modem design requires a modification to prevent some handhelds going into transmit when the TX audio plug is inserted into the Mic input of the handheld. A small mono block or similar capacitor of around 1 μf needs to be inserted between pin 1 of the 5 pin DIN socket (J2) and the top of VR3. This capacitor provides DC isolation for HTs which go into transmit when a resistor is placed between the external Mic input and ground. Unfortunately, the value of VR3, being only 1 k, is too low for some units and causes the HT to go into transmit all the time. The HT should only transmit when the Mic input is earthed via R21 and the TX switching transistor, T3.

References

1. The "Pocket Packet modem", T. Moffat, Electronics Australia, Jan '93.
2. ARA super modem, T. Tregale & K. Summers, ARA Vol. 10 No. 1
3. An LSI Modem for Amateur Radio, ARRL Handbook 1986, Chapter 29.

* *7 Worthing Road, Devon Meadows, 3977* **ar**

WIA News

Is this a record net?

The Coral Coast Group may be the longest running net in Australia, or perhaps the world, according to Les Daniels, VK2AXZ. It has been running 7 days a week since it was started by Les Bell VK4LZ in September 1967.

The dedication and enthusiasm shown by Les Bell and his wife was acknowledged by the Coral Coast Group, on the silver anniversary of the foundation of the net, with the presentation of a plaque to Les.

SSB and Audio Quality

*Jon Lindstad VK2WF * describes how to make your SSB signal sound better.*

Comments and discussions about microphones, overheard on the HF bands, have made me believe that the basics of SSB signal generation and the factors that affect the audio quality of an SSB signal are poorly understood by many. Problems with "dull" or "tinny" audio quality, and distortion, are often blamed on the microphone although the problem in most cases lies somewhere else. This article is aimed at the novice, but I suspect that it could benefit the odd old-timer as well.

Fig 1A below shows the block diagram of a basic SSB transmitter.

Modern transceivers, especially the ones that have a general coverage receiver, have a much more complex transmitter diagram than the one shown in fig 1A, but the basic principle is the same. The main differences are that more frequency conversions take place (ie more blocks of the type "BAL MOD or MIXER") and that the block marked "HF OSC" would be a complicated frequency synthesiser. In a simple transmitter for the 80 m band the block marked "HF OSC." could simply be a VFO (variable frequency oscillator). The frequencies shown on the diagram are for a transmitter tuned to transmit on Lower Side Band (LSB) at 3650 kHz as discussed below.

If you look at the block diagram of your own transceiver it may be difficult to identify the corresponding blocks because they may be labelled differently. For the purpose of this discussion there is no difference between the blocks I have labelled "BAL MOD" (balanced modulator) and "TX MIXER". They are both usually double balanced ring modulators made up of diodes and toroid core transformers to reduce the levels of the input signals appearing at the output. On your own block diagram you may find symbols rather than text for these blocks. Some symbols used for Mixers, Modulators and Balanced Modulators are shown in Fig 1B.

Let us now examine the various parts of this block diagram where a change in signal quality is likely to occur.

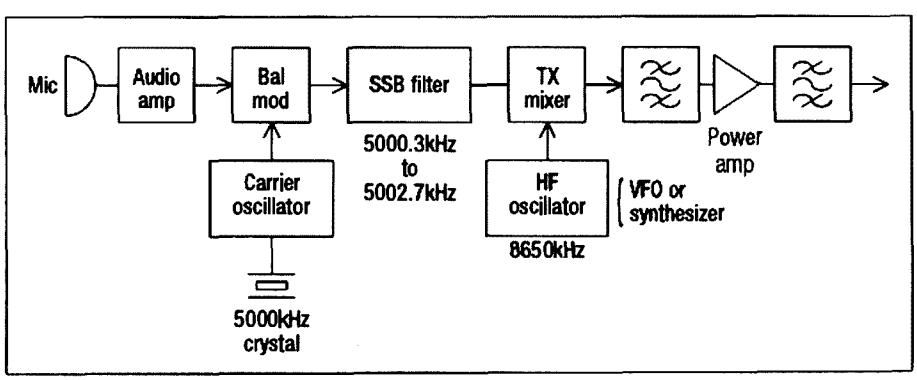


Figure 1A — Block Diagram.

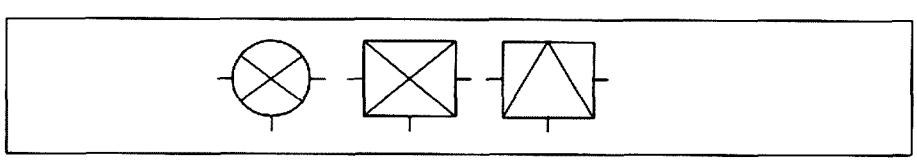


Figure 1B — Mixers or Modulators.

1. The Microphone

If the microphone is defective, say the coil of a dynamic microphone rubbing on the magnet, or an electret microphone operating without proper bias, then severe distortion can occur. In most cases, however, the microphone is far better than any other part of the whole system as far as audio quality is concerned, and should not be altered or replaced to remedy problems elsewhere.

2. The Audio Amplifier

The level of the audio signal through this amplifier is usually low so that negligible distortion will occur. However, the amplifier is often used to modify the frequency spectrum of the signal from the microphone. If the microphone has a flat response, this is necessary to enhance the part of the speech spectrum that contributes most to intelligibility. About 70% of the power in typical male speech is concentrated below 300 Hz. But this part of the speech spectrum contributes almost nothing to intelligibility. By shaping the frequency response of the audio amplifier these low frequencies can be reduced before they reach the modulator. More power will then be concentrated in the desirable higher portion of the speech spectrum. This becomes even more important if an audio speech clipper is used. If the low frequencies are allowed to reach the clipper severe intermodulation distortion (mixing) will occur.

3. Carrier Oscillator and HF Oscillators

In good commercial equipment these oscillators (or synthesisers) are clean and stable. However, in older equipment or home brew rigs these oscillators could become frequency modulated. This occurs when the Tx amplifier draws heavy current from a badly regulated power supply, causing the supply voltage to the oscillator to vary. The result can be dreadful.

4. Carrier Oscillator Adjustment

Improper adjustment of the carrier oscillator frequency is one of the most common reasons for reports of "bassy" audio. The microphone and audio amplifier frequency responses will usually only cause a moderate reduction of frequencies below 300

Hz. It is up to the SSB crystal filter to get rid of the rest. But this can only happen if the carrier oscillator frequency is correctly adjusted with respect to the edge of the crystal filter. Let us assume that the crystal filter has a frequency response as shown in fig 2, and that the carrier oscillator is adjusted to 5000 kHz. The audio signal into the modulator is mixed or "multiplied" with the carrier, and the result, coming out of the modulator, is the carrier (suppressed due to the modulator being balanced) plus and minus every frequency in the audio signal. We can see straight away that carrier minus audio will be less than 5000 kHz and will therefore not go through the filter. Carrier plus audio on the other hand will come through depending on the audio frequency. The table below shows how the various audio frequencies will fare.

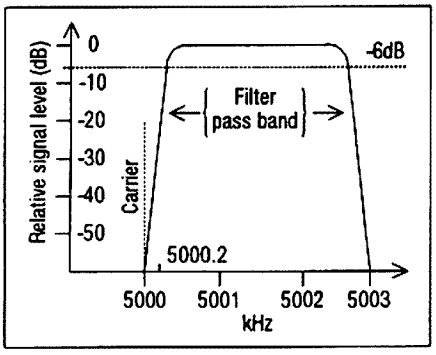


Figure 2 — Filter Response.

AUDIO Hz	AUDIO + CARRIER kHz	FILTER ATTENUATION dB
100	5000.1	40
200	5000.2	20
300	5000.3	6
500	5000.5	0
2400	5002.4	0
2700	5002.7	6
2900	5002.9	40

The situation shown in the table is typical for a well adjusted carrier oscillator (and an excellent crystal filter).

It takes very little change in the carrier oscillator frequency to have drastic effects on the audio. Look at Fig 2. If the carrier is shifted to 5000.2 kHz (+200 Hz), then the attenuation in the filter for a 100 Hz audio frequency would only be about 6 dB, and the signal would sound "bassy". If on the other hand the carrier was shifted down to 4999.8 kHz (±200 Hz), then we would have an attenuation of 20 dB for a 400 Hz audio frequency and an attentuation of 40 dB for a 300 Hz audio frequency and the signal would sound "thin". (Remember that you are moving the carrier and the sidebands back and forth along the horizontal axis where the filter curve is fixed). If you are a male with a deep voice and have been smoking 20 cigarettes a day for the past 60 years then the last example may be suitable for you. If on the other hand you are a YL with a voice like a canary, then the first example (5000.2 kHz) may be better. Most people will fit somewhere closer to the example in the table. Don't forget that the carrier oscillator frequency will affect the receiver in the same manner, and that it also will affect the calibration of the frequency display or scale.

5. Mixers/Balanced Modulators

These are designed to be non-linear devices and will therefore cause "modulation" or "mixing" of the carrier with the signal frequencies. In this case this is the desired effect. The carrier is at a high level and will drive the diodes (if diodes are being used) into non-linearity. With sufficient drive level the diodes act as switches. The signal (audio or RF) on the other hand, must be at a low level to avoid distortion. If the signal level is too high it will itself "drive" the mixer and cause mixing or intermodulation between the individual components or frequencies of the signal. The result is audible distortion in the received signal, and increased bandwidth of the signal coming out of the mixer.

6. Power Amplifiers

Overdriving of the final amplifier is a well known and well documented problem and will not be covered here. If you want to transmit a clean signal that sounds good at the other end, then keep the mic gain down. For a 100W rig the ammeter should only kick up around 4 A (12V supply). If this does not get you through, fix your antenna!

Remedies for old out of tune rigs or raspy voices

If you get reports of poor audio and you have tried another microphone, checked the power supply regulation, ensured that the cable from the PS is short and solid, then you may have to attack the audio amplifier or alter the tuning of the carrier oscillator. (The problem could be in the power amp as well, but that is another story).

Adjustments on your transceiver

If you think there is a need to adjust the carrier frequency of your transceiver and you decide to be brave and take the covers off and do it yourself, the first thing to do is to identify the carrier crystals for upper and lower sidebands on the block diagram in your handbook. Look for crystals with approximately the same frequencies as the SSB crystal filter. Then find the same crystals on a component layout diagram or photograph (as for IC735). If you are successful so far, it should be easy

to find the crystals in the transceiver. Next to the crystals there will be trimmer capacitors for fine tuning of the respective crystal frequencies. But be careful; apart from USB and LSB the same crystals may be used for AM, FM and CW, with different trimmers being switched into action for each function by diodes. When you think you have identified the trimmer for LSB, say, note the exact position of the screwdriver slot, just in case you are wrong. Set the receiver to LSB and tune the receiver to a strong carrier, such as a crystal calibrator and obtain a tone of a few hundred Hz. Carefully turn the trimmer by a small amount. You should hear the tone change frequency. If it does not, you have adjusted the wrong trimmer and you must reset it to its original position. When you have found the right trimmer, tune in a strong SSB signal, preferably someone you know, and adjust the trimmer until the signal sounds good. You will have to retune the receiver each time you adjust the trimmer. The effect the trimmer setting will have on your transmitted signal will be the same as the effect it has on the signal you are listening to. Now check the frequency response of the receiver. Turn on the crystal calibrator of your set or tune in another strong carrier (S9). Watch the S-meter as you tune through the signal. The audio frequencies where the S-meter reading drops one or two S points below the maximum reading will be the upper and lower edges of your pass band. If your S-meter is good (few are!), it should show a change of one S point for every 6dB change in the signal, and you could plot the complete frequency range of the signal by comparing the audio tone to the tone from a calibrated audio oscillator, or by reading the digital display of your transceiver.

Tailoring the audio amplifier to your voice

If you have a deep raspy voice it could be necessary to alter the frequency response of the audio amplifier. As the various rigs have different designs, it is impossible to give a simple recipe. The example below shows a flat microphone driving an amplifier with a lower 3dB

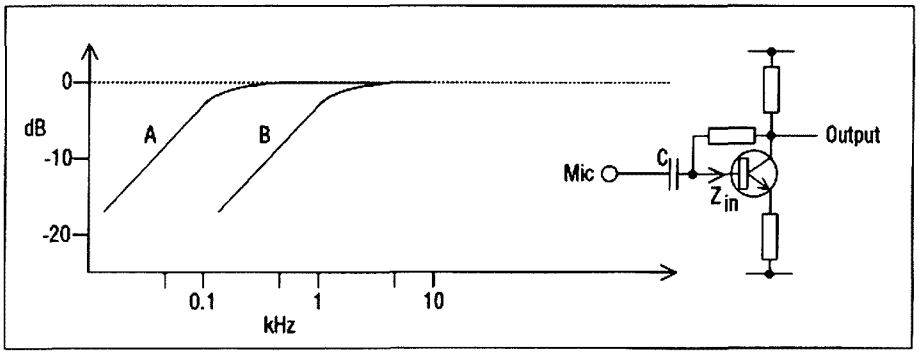


Figure 3 — Audio Response.

cutoff at 100 Hz (Fig 3, curve A). The input impedance is assumed to be 16 kohm. If we reduce the coupling capacitor C from 0.1 μF to 0.01 μF the frequency response will change as shown in curve B. You will probably find it difficult to establish a figure for the input impedance of the amplifier. Experimenting with values for C between 1/2 and 1/10 of the original value should bring results.

Happy experimenting!

PO Box 457, Armidale, NSW 2350

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of September 1993.

L10151 MR G M MCGOWAN
L20957 MR G NASH
L30866 MR W MCEVOY
L30867 MR R E FAY
L40088 MR H PEDERSEN
L40329 MR D V COLLINS
L40330 MR J E REAY
L50309 MR G C BRUECHER
L50311 MR L PEACOCK
L50313 MR A C SAUNDERS
L50316 MR W G GITSHAM
L50317 MRS M D S COLLINS
L60332 MR N E CHAPMAN
L60333 MR S FARRANT
VK1LEC MS L E CONDIE
VK3EBT MR B J TREASURE
VK3NF MR M MARTINI
VK3RN MR A H MAMESAH
VK4BUR MR P R BURR
VK4CQH MRS H A LEHTO
VK4CRL MR A H F HUISMAN
VK4CTC MR T CUTTLE
VK4CW MR F HOCKING
VK4DDJ MRS J SIM
VK4JBS MR B F STEVENS
VK4TEV MR P J PICKERING
VK4TH MR T L HAMMOND
VK5LDA MR L D AUSTIN
VK5NDZ MR G J BRIDGLAND
VK5ZOB MR F R O'BRIEN
VK8NSB MR S L BIRKIN
VK8XDB MR D R BRAMICH

Changes for Taipei League

The Chinese Taipei Amateur Radio League (CTARL) of Taiwan now has a new President and management team who will run the organisation for the next two years.

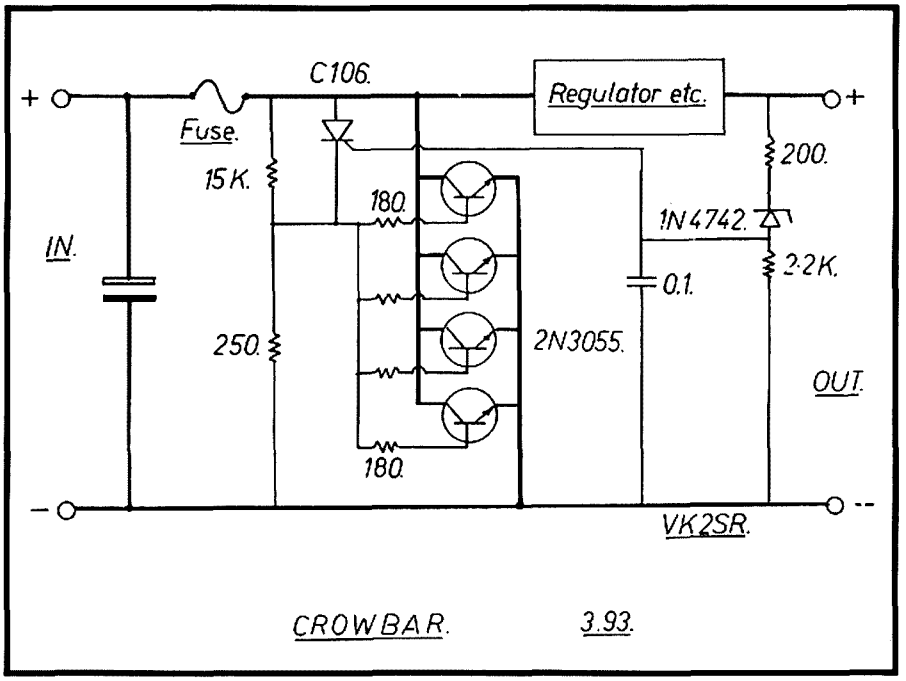
Bolon Lin BV5AF is the new President, taking over from Tim Chen BV2A who has retired. He was the founding President of the CTARL in 1991. The CTARL is a member of the IARU (Region 3).

Vice President and IARU Liaison Officer is Ralph Yang BV2FB, who was formerly the Secretary General. The new Secretary General is Anthony Li BV4OB. Deputy Secretary General is Bear Huang BV2WC.

The CTARL operates the Taiwan QSL Bureau, which is PO Box 93, Taipei, Taiwan ROC. The League is headquartered in Changhua. You can contact them by mail at PO Box 39, Changhua, Taiwan ROC.

An Effective Junk Box Crowbar

*Geoff Switzer VK2SR * puts his junk to practical use.*



This circuit is intended for the interest of those who have a junk box stock of rugged transistors and who want to avoid the cost of an expensive Silicon Controlled Rectifier (SCR).

The values shown are those used in several of my own "marks" of the idea. However, a few comments regarding the circuit operation are in order. The principle is to fire a light duty SCR which, in turn, turns on hard as many suitable transistors as may be necessary to reliably and quickly blow the fuse.

I settled on a current of 3 amps per 2N3055. One particular crowbar has eight in circuit. No heat sink is necessary as the conduction time is very short, only as long as it takes to blow the fuse.

The sensing circuit is conventional. The 200 ohm resistor could be a preset of, say, 500 ohm. The values shown sense an over-voltage of 14.5 volts.

The 180 ohm base resistors are desirable and are common junk box values. Some care should be taken in selecting the 15 kohm and 250 ohm resistors across the incoming supply. These values provide a standing bias to the 2N3055s which should only draw a few milliamps for the group and should therefore stay cool.

When fired, the C106 effectively short circuits the 15 kohm resistor and the whole input voltage, say 25 volts, is applied to the bases. At the same time the 250 ohm resistor is placed directly across the supply and will carry 100 mA until the fuse blows. This is only for a few milliseconds but the power dissipated for this time is 2.5 watts.

The 0.1μf capacitor on the C106 gate prevents any false spikes. A smaller value will reduce the time constant.

The whole idea is presented as a basis for experiment. It could become a valuable outboard attachment to such commercial power supplies which do not include over-voltage protection.

* *53 Turf Street, Grafton NSW 2460*

ar

WIA News

New amateur radio society for the Russian Federation

The disintegration of the USSR saw the collapse of the former country's amateur radio society, the RSF. There is now a new national amateur radio organisation registered in the Russian Federation, known as (in English) the "union of radio amateurs of Russia", otherwise called the SRR. It was registered last April with the Russian Ministry of Justice as the country's national amateur radio organisation.

The SRR is seeking membership of the International Amateur Radio Union (IARU).

The new society publishes a bi-monthly magazine and runs a QSL bureau for Russian Federation amateur operators.

The inwards and outwards QSL bureau address is **PO Box 59, Moscow 105122,** Russia. This is also the mail address for the SRR.

This bureau will also serve for amateurs in some CIS countries, although the SRR does not say which as this is currently the subject of negotiation.

The SRR advises that the safest way to QSL with Russian Federation amateurs is via the above address.

If you're going to the Russian Federation and are interested in operating while you're there, you should apply to the SRR at the above address. They have an agreement with the Telecommunications Authorities which enables them to provide this service.

We are unsure where this leaves the Krenkel Radio Club, which earlier this year advised they had taken over from the previous Radio Sport Federation and was running Box 88, Moscow and arranging contests, exhibitions and DXpeditions (see August *WIANews*).

Repeater Reverse Switching for the Dick Smith Explorer

*Here is an interesting modification for the Dick Smith Explorer designed by A Crewther VK3SM * and I Simpson VK3XIS **.*

The Explorer has no capability to check the input of repeaters on 430 MHz. It can easily be added using only a few parts and the same circuit as the original offset oscillator.

A small spring return non locking switch mounted over the S meter does the switching of the 10V Rx line just as the repeater switch does for the transmitting crystal.

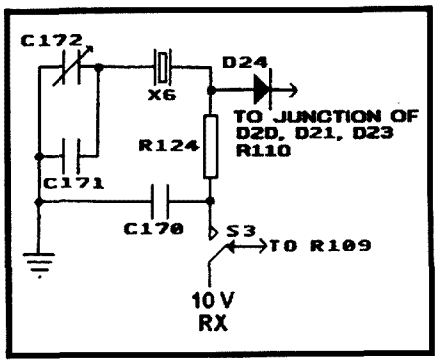
The method of obtaining the operating frequencies for the transceiver is described on page 15 of the manual. The operating frequencies are produced by the combination of three separate oscillators. Of these only one can be altered and this already has three crystals fitted. These crystals are :- receive, simplex transmit, and repeater transmit.

As the repeater receiver operates 5 MHz below the transmit frequency we have to reduce the receiver frequency on our unit to hear the input of the repeater.

The transmit oscillator crystal for repeater operation is 0.4556 MHz lower than the simplex transmit crystal. This means that the receive crystal for repeater input must also be reduced by the same amount. The new crystal needs to be 46.11661 MHz.

The crystal was supplied by a local crystal supplier. A copy of the oscillator circuit was sent to the supplier in order to assist in getting the crystal on the right frequency.

The few parts were mounted on a scrap of matrix board supported by a couple of stiff wires. The wires were anchored to the PCB through a couple of holes drilled near the connection point.



When the soldering is finished the oscillator frequency can be checked with a counter at the junction of C57 and R53. Grid Square F9 on Main Board. Alternatively a receiver tuning below 144MHz can be used. For channel 28 on the lower band, if the 80 channel modification has been made, the frequency is 140.866 MHz.

Parts List

C170	.01 μF ceramic
C171	10 pF NPO
C172	20 pF Trimmer
D24	1N914
R124	2.2 K 1/4W
S3	C/O NL DS Cat P7578
X6	46.11661 MHz

* *28 Reynolds Pde Pascoe Vale Sth 3044*
** *8 Edward St Chadstone 3148*

ar

Technical Abstracts

Gil Sones VK3AUI

Iron On PCB Resist

Photocopier Toner can be used as resist when making Printed Circuit Boards. The main problem is to get the pattern transferred onto the PCB laminate. John Grebenkemper KI6WX in QST for July 1993 presents a step by step approach to producing etching resist patterns using a photocopier. The toner pattern produced by the photocopier is transferred to the laminate using a household iron.

The pattern cannot be directly deposited on the laminate by the photocopier but can be transferred using a household iron as a heat source. Experimenters would be well advised to obtain their own iron to conduct experiments. Other users of an iron may not be sympathetic to your experiments.

First you must obtain a mirror image of the pattern. Use some transparent film in the photocopier such as is used for transparencies. Then simply turn it over and print the mirror image onto plain paper in the photocopier. Use a plain backing sheet behind the transparency to obtain the component side view in this step.

Now thoroughly clean the PCB laminate. This must be really clean if the Toner is to stick to it.

The component side photocopy is now placed with the image against the clean PCB laminate copper side and held in place. The iron is then used to iron the back of the paper. The iron is set to the cotton or linen position of about 300°F or 150°C. Clean sheets of paper between the ironing board and the laminate, as well as the photocopy sheet and the iron, are advisable in case of inadvertent transfers. The ironing action should be smooth and in a circular motion.

The toner should start to stick to the copper of the PCB laminate. Be careful to uniformly heat the whole area so as to get a complete transfer. Be careful as the whole sandwich will be very hot.

Let it cool down and then place the laminate with adhering pattern and paper in a solution of bleach for several hours. Overnight would be about right. The bleach solution is made up with a cup of bleach to 4.5 L of water. The bleach can be bought at a supermarket and either the house brand or "White King" should be suitable. The active ingredient is sodium hypochlorite. This step should be carried out in a well ventilated area as the bleach has a pretty strong chlorine smell.

The toner pattern produced by the photocopier is transferred to the laminate using a household iron.

After a period in the bleach the paper will be somewhat softened. You can then gently scrub away the soggy paper with a soft brush. Be careful not to damage the pattern adhering to the copper surface.

Any scratches or blemishes can be touched up with a resist pen. The board is then etched in the usual way in Ferric Chloride. The etched board is then cleaned up using steel wool to remove the toner.

The QST article shows some pretty fine examples of the technique including a multiplier to 10 GHz on a Teflon laminate. It may pay to use a less critical layout and less exotic material for your first attempts. Good luck and good etching.

160 Metre AM Transmitter Update

In Technical Abstracts, Amateur Radio, Aug 1993 the circuit of a 160 metre AM transmitter was given. Unfortunately, the source circuit needs correction. In Rad Com August 1993 the following correction was given.

"The inverting input to the microphone amplifier (IC1a pin 2) should be directly connected to the slider of RV1. Back to back diodes D1 and D2 are then connected between pins 1 and 2 of IC1a."

ZL LF Tests

Break In, August 1993 carries news of LF tests being carried out in New Zealand on 181 kHz. The tests are conducted on Thursday evenings from 0900 to 1000 hrs UTC and reports are welcome even if the report is negative. The ZLs look for VKs on 3690 LSB or 3689 CW at 20 minutes past the hour with Kevin ZL4MD as the contact station.

There are a number of ZL stations active on LF and reception should be possible. Many radios will cover this frequency but a loop and loop preamp may help. Look back through Amateur Radio magazine for articles by VK3ACA and VK5BR for

information regarding propagation and equipment for these frequencies.

Long Distance Tx Hunt

For all those who think they have been on a long distance transmitter hunt the Southern California All Day Hunt has set a new standard. This hunt which takes all day and can extend for 24 hrs had a previous record distance of 252 miles or 406 km approx. There are a number of transmitters to find along the way but the main transmitter must be receivable at the start and within the continental USA.

The new record is 344 miles which is three states away in Utah from the start in Los Angeles. The hunters had to resist the pokies in Las Vegas on their way to find the transmitter. The metric distance is approx 554 km.

The transmitter started off with 600 watts output into a 15 element beam. Quite a fox transmitter but then it had to be receivable for quite a long haul. The winner was N6MI who covered 460 miles to find all the 4 transmitters in the hunt. The last transmitter was found after midnight in a snowstorm.

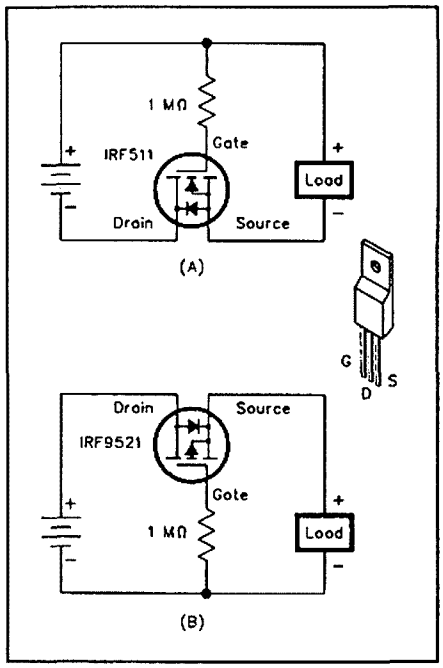


Fig 1 MOSFET Polarity Protection Circuit.

The transmitter was hidden by N6YKE and AF6O. Six teams took part and four found all the transmitters. The hunt took place on Feb 27 1993.

The story of the hunt is in 73 Amateur Radio Today, June 1993 issue.

Reverse Polarity Protection

Some useful circuits for reverse polarity protection appeared in QST July 1993 in an article by Michael A Covington N4TMI. The chances of reverse polarity are fairly high, particularly with the use of plug packs and the coaxial style power plugs used. The polarity of these varies between makers and can present a hazard for your gear.

The traditional approach has been to use a diode either in series or parallel. The series diode provides a voltage drop which may be unwelcome. A parallel diode bypasses the reverse polarity and hopefully pops the fuse before it melts as well as the fuse.

A power MOSFET can be used as a switch. It must be connected the other way around to what you would expect as it also contains a parasitic diode between drain and source. The FET is, however, bidirectional and will work in this fashion. An N channel

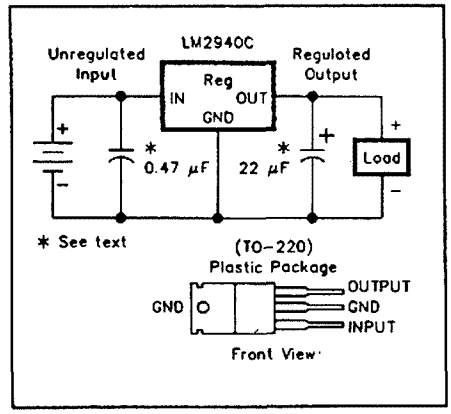


Fig 2 LM2940 Low Voltage Dropout Regulator with inbuilt reverse polarity protection.

FET must be put in the Negative Line and if you want to switch the Positive Line then you will need a P channel FET. The circuit is shown in Fig 1.

Whilst not as common as 2N3055s there are quite a lot of Power MOSFET's around at reasonable prices. They have the advantage of a very low ON resistance which leads to a very low voltage drop.

For situations where you are using a voltage regulator and polarity reversal is a possibility, then the LM2940 series and LM2941 have built in reverse polarity protection. The other advantage of these regulators is their low drop-out voltage of around 0.5 Volts. See Fig 2 for the circuit. The capacitors at input and output must have low series resistance and must be close to the regulator IC.

ar

Help stamp out stolen equipment. Keep a record of all your equipment serial numbers in a safe place.

The Rooftop Run

Bob Tait VK3UI explains why only fit operators meet this WICEN challenge.

History of the Bogong to Hotham Event

In the days when technology didn't count for very much, a lone skier, Charles Derrick, attempted a marathon ski trek from Mountain Creek to Mount Hotham. An arduous journey at the best of times. An impossible one in a blizzard.

In September 1965, Charles Derrick set out in a late winter burst of foul weather using equipment that lacks the sophistication of modern day technology. His endurance and tenacity were supreme as he kept skiing through horrendous gales, fighting fatigue.

Graeme Wheeler in his book "Walk in the Timeless Land" poignantly writes, *"He had pushed almost 30 miles of terrain beneath his skis, had gained and dropped over 9000 feet. Within a mile of his objective the weather had pounded him to a halt, frozen, exhausted".* A cairn now marks the spot close to Mount Hotham where Charles Derrick perished.

The Footrace

The first footrace was held in 1984 over the same course Charles Derrick attempted but during summer, not winter. Traditionally it has been held in late December or early January. Even so, the weather can be foul, as it has on a few occasions; it can also be extremely hot and heat exhaustion can be a worry.

Russell Bulman, orienteer and organiser, and founder of the Rooftop runners (a group of runners who like running mountain trails) devised the footrace to follow Charles Derrick's original course. The challenge of the tough course soon drew quite reasonable numbers of competitors. The Australian Ultra Runners Association Inc (AURA) has now taken over the running of this the hardest and most difficult footrace in Australia.

The record for this 60 km course stands at 6 hours 58 minutes and 52 seconds.

The Course

The course has an overall climb of 3000 metres and an overall descent of about 2000 metres. In a total distance of approximately 60 km, this equates to the toughest trail run in Australia. The start is particularly tough in that after an initial 2 km of undulating 4 wheel drive track, the trail climbs 1300 metres in the next 6 km to the summit of Mt Bogong. After losing a lot of body fluid through perspiration on the way up, the steep descent into Big River and T- spur wrecks the runners' legs. The relatively easier second half of the race becomes tortuous as they then push their sore and tired bodies across the high plains, down into Cobungra Gap, Dibbin's Hut, Derrick Hut past Mt Loch and on to Mt Hotham. The weather can even be unkind to them in the last stages of this event as the cloud can close in and obscure the finish; which can result in runners becoming disoriented and lost, only metres from the line. Once they cross the finish, dedicated teams of helpers swoop on the weary and fill them with warm soup and provide warm dry clothing. The helpers then whisk them off the mountain to relax in more hospitable surroundings to discuss the events of the day, or perhaps to say "never again", until next year!

A pretty tough event for those wishing to sharpen their field skills as WICEN operators.

Remember to leave a three second break between overs when using a repeater.

WICEN

Having given you an overview of this event, it is also likely that it may also be a pretty tough event for those wishing to sharpen their field skills as WICEN operators. This event is the only activity that I'm aware of that has the ability to test not only the resources of operators, but their fitness as well. There are 13 checkpoints. Of these only 5 can be reached by road; the other 8 must be reached by walking from 2 hours for the shortest (pole 333) to 3.5 hours to Roper's Hut. All the equipment required must be carried into the site, such as a fold up Yagi for 2 metres, a handheld, spare batteries for 2 days operation, a map of the High Plains area; along with all the necessary equipment for an overnight stay in the area. You need warm clothes, as it can get very cold at night.

The check points are as follows: Mountain Creek, Bivouac Hut, Mt Bogong Summit, Cleve Cole Hut, Maddison's Hut, Roper's Hut; Watchbed Creek, Cope Hut, Pole 333, Dibbin's Hut, Derrick Hut, Mt Loch car park, Mt Hotham. The area map is called "Bogong 8324" and is available from VICMAP.

Check point teams usually comprise a radio operator, a first aid person and a representative of AURA. In the past these teams have been found to work very well together. If you like bushwalking, photography, amateur radio and spectacular views, this is the place for you. Have you activated the Alpine National Park? If not, how about coming along on the 2nd January 1994?

If you are really interested in trying something different how about getting in contact with Phil Longworth VK3XQP (060) 58 7711, Bob Tait VK3UI (03) 785 1739 or Alan Burgess VK3QL (03) 754 7943 about this challenging event. We also hope to have electronic media and print media coverage for this year's event.

ar

Meteor Burst — An Introduction

Ross Dannecker VK4ZFD presents an interesting facet of our hobby*

Billions of tiny meteors entering the earth's atmosphere each day give rise to ionised trails capable of "reflecting" radio signals. These trails occur at a height in the order of 100 km and last, on average, for a few tenths of a second.

Although billions of meteors enter the earth's atmosphere daily, only those few entering at the right place with the right orientation will support communications between two specific locations. The signal "reflected" back to earth occupies a footprint typically 5 km wide by 25 km long.

The arrival rate of meteors in the atmosphere varies somewhat. Over a one-day period, it is at a maximum around sunrise, and at a minimum around sunset. Over a year, it is at a maximum in summer and a minimum in winter. Meteor showers also occur at certain predictable times of the year. Omitting the showers, the variation in arrival rate between sunrise in summer and sunset in winter is in the order of 10:1.

The received level from a meteor trail reflection is a function of the power transmitted, the free space propagation loss over the path and the loss incurred in the re-radiation by the ionised plasma of the trail. The received level is also inversely proportional to the cube of frequency. Therefore, for best performance, the lowest available frequency should generally be used. For regulatory and other reasons, meteor burst systems seldom operate below 30 MHz. Most commercial and military systems throughout the world operate in the 40-60 MHz region.

Typical modulation rates of the transmitted data range from 2000 to 9600 b/s. Consider a system operating at 4000 b/s. Over a one-hour period there may be 30 useable meteor bursts averaging 30 ms each. The average data throughput would therefore be (4000 × 30 × 0.3)/3600 = 10 b/s or about two typed A4 pages per hour.

Meteor burst systems operate in several possible modes:

(1) Full Duplex — simultaneous TX and RX on two separate frequencies (highest throughput).
(2) Half Duplex — alternate TX and RX on two separate frequencies (simplest hardware).
(3) Simplex — alternate TX and RX on the same frequency.

More packets will then be sent until the meteor burst ends or the message is completed.

A central control station will send out a general poll to its remote stations. These usually operate in the half-duplex mode. When a remote station successfully receives the poll signal at the beginning of a meteor burst, it switches to the transmit mode, sends its address and a packet of data back to the central station and then listens for an acknowledged signal from the central station. More packets will then be sent until the meteor burst ends or the message is completed. Data exchange protocols include a lot of error checking and correction.

Useable meteor trail reflections occur over a wide amount of sky. For a 1000 km path, most of the reflections are from trails located about 100 km on either side of the great circle path connecting the two sites. This influences the choice of antenna systems used for meteor burst. While high-gain narrow-beamwidth directive arrays will increase the system gain, for path lengths less than 500 km the beam may be so narrow as to miss illuminating the so-called "hot spots" on either side of the direct path. Also, for short distances, trails above and behind the central station can be useful. To improve short-distance communications, a Yagi may be tilted up or a less directive antenna system used. Ground reflection effects can also be used to advantage. Polarisation used is usually horizontal for noise reasons.

Because of the low received power levels of a meteor burst system, the radio noise environment is critical. Noise can be galactic, man-made or receiver.

(a) Galactic noise can be calculated from available formulae. At a frequency of 54 MHz and an RF bandwidth of 10 kHz, the galactic noise level is -122.5 dBm.
(b) A receiver noise factor of 5 dB would be typical at this frequency. This would result in an equivalent input noise power of -128 dBm for the receiver.
(c) Man-made noise varies considerably with location and time. CCIR report 258-4 gives typical average values of -109.5 dBm for a residential location, and -114.8 dBm for a rural location for this example. These results may be exceeded for 10 per cent of the time by 12 dB and 5 dB respectively, giving design levels of -97d dBm and -109.5 dBm for the residential and rural situation for good system availability.

Consider now the received levels to be expected for a system with the following parameters:.
Transmit power 100 watts (+50 dBm)
Range = 1000 km (Brisbane to Canberra)
TX antenna = RX antenna = 5-element yagi (12 dBi gain)
Frequency = 54 MHz
Feeder losses <1 dB.

The free space path loss is 127.3 dB. If the meteor trail "reflection" were lossless, then the received level would be 50+12+12−127.3 = −53.3 dBm. However, the meteor trail "reflection" introduces a significant loss which lies in the range of 35-60 dB, depending on the orientation and degree of ionisation. The mean value would be 53 dB, and subtracting this from the free space received level calculated above gives a meteor burst average received level of −106 dBm.

Meteor burst communication systems typically use binary phase

shift keyed modulation for the data. For a maximum manageable bit error rate in the raw data of 1 in 1000, such a BPSK system requires a signal-to-noise ratio of 8 dB. Therefore, the received noise level of the system under consideration must be less than −106-8 = −114 dBm to work for an average ionised trail.

Recalling that for the residential situation the noise level was −109.5 dBm average with −97 dBm for 10 per cent of the time, one can conclude the meteor burst system under consideration will not work except for a small number of highly ionised trails. For the rural situation, the expected noise levels were −114 dBm average with −109 dBm for 10 per cent of the time. One can therefore conclude that the average ionised trail will produce a workable result for most of the time. If a very quiet rural site is available, a noise level of −116 dBm or better could be expected. The system under consideration would then work for a high percentage of the time.

The above example shows just how marginal meteor burst communication systems are. Everything has to be optimised, especially local received noise level.

If you are interested in hearing some meteor burst propagation, consider listening for TV Channel 0 transmissions. (If you are at least 300 km distant from a high power transmitter, of course). The audio carrier frequency is 51.75 MHz, while the video carrier is 46.25 MHz, and there are two high power transmitter locations in Australia. You will need a wide-band FM receiver for the audio, but a narrow-band AM receiver is OK for the video. Because of the brief nature of the bursts, some receiver mutes may not open in time, so leave the receiver unmuted, if you can stand the noise. Sunrise in summer is the best time to listen. The distance limit is about 2000 km for meteor burst.

For the intrepid amateur experimenters, please note that the practical working range using Yagi antennas is roughly from 300-1000 km (ie, there is a "skip distance" effect). Note also the fact that the performance decreases with the cube of frequency; so results using the two-metre band will be 20 times worse than can be obtained using the six-metre band, given the same technical parameters. In fact, the six-metre band is well suited to meteor burst communications.

For further reading — Meteor Burst Communications by Jacob Z Schanker, Artech House Inc, ISBN 0-89006-444-X.

* *PO Box 570, Rockhampton QLD 4700*

ar

WIA News

Historic UK-VK contact celebrated

The first radio contact between the United Kingdom and Australia took place on the 22nd of September, 1918 when Guglielmo Marconi sent a message which was received by Ernest (later, Sir) Fisk at his home in Wahroonga on Sydney's upper north shore, which still stands.

A monument commemorating the event stands outside the house.

The Dragon Amateur Radio Club of North Wales wrote to the WIA with a plea for information on who was involved, which we published in August *WIANews.*

Jo Harris VK2KAA of the newly-formed Wahroonga Amateur Historical Radio Association (WAHRA) contacted the Dragon club and organised a celebratory two-way contact to coincide with an event to commemorate the historic occasion.

WAHRA obtained a special cailsign, VK2WAH, for the re-enactment, which included 400 local school children.

Successful contact was made between VK2WAH at Wahroonga and GB2VK, operated by the Dragon club at Gwynedd (pronounced "Gwynneth") in Wales at 0708 UTC on 22 September.

Apart from the school children, the gathering at Wahroonga included local residents, historians and local amateurs. Distinguished guests included Dr Graham Fisk — Sir Ernest Fisk's son — John Dougall managing director of AWA, Pierce Healy VK2APQ, and the Mayor of Kuring-Gai, all of whom addressed the gathering. Dr Fisk was accompanied by ten other members of the Fisk family.

John Howard VK2AMH played a tape of the original Morse message to the school children.

One interested visitor to the gathering learned of the event while reading the *Sydney Morning Herald's* front page "Column 8" on the train that morning. He left the train and returned to Wahroonga. it was Robert Maclurcan, the son of one of Australia's radio pioneers, Charles Maclurcan who is honoured in the 1922-registered Constitution of the NSW Division.

At the Welsh end, a BBC recording crew attended along with the local Member of Parliament. The Welsh amateurs were delighted when the MP promised that a monument would be erected at the site of the first transmission.

WAHRA gained some valuable local publicity for the occasion. A lengthy article on the event and amateur radio involvement appeared in the *Sydney Morning Herald* the Saturday before the event, accompanied by a photograph showing the Fisk monument. Apart from the SMH Column 8 story on the day, the following week there was a story and picture in the local paper, showing Jo Harris VK2KAA with the equipment.

VK2WAH operated for 24 hours only. While band conditions were very poor and few contacts were made, the station managed to work most continents. A special QSL card will be issued for contacts made during the event.

It is hoped that a tradition will start for a Wahroonga to Wales contact to be made every year on 22 September.

(Thanks to Jo Harris VK2KAA for supplying information used in this item).

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BX293	$28.00
Antenna Collection — RSGB	BX391	$44.00
Antenna Compendium Vol 2 — ARRL	BX292	$31.50
Antenna Impedance Matching — ARRL	BX257	$30.00
Antenna Note Book W1FB — ARRL	BX179	$20.00
Antenna Pattern Worksheets Pkt of 10	BX902	$3.00
Antennas 2nd ed John Kraus — 1990	BX259	$104.00
Cubical Quad Antennas- Haviland — 1993	BX41	$37.50
Easy Up Antennas	MFJ39	$39.25
G-QRP Antenna Handbook	BX452	$22.50
HF Antennas for all Locations — Moxon	BX189	$45.00
Antenna Compendium Vol 1 — ARRL	BX183	$28.00
Novice Antenna Notebook — DeMaw W1FB — ARRL	BX182	$18.00
Physical Design of Yagi — 3.5" IBM Disk	BX386B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BX388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BX\$88A	$28.00
Physical Design of Yagi Antennas — The Book	BX388	$40.00
Practical Antenna Handbook — Tab	BX028	$49.00
Practical Wire Antennas — RSGB	BX298	$32.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BX348A	$26.00
Reflections Transmission Lines and Antennas — ARRL	BX348	$51.00
Simple Low Cost Wire Antennas	BX218	$25.60
Smith Chart Expanded Scale PK of 10	BX903	$8.60
Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$8.60
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$6.60
The Antenna Handbook — ARRL 1991 edition	BX370	$48.00
The Easy Wire Antenna Handbook	BX002	$20.00
Transmission Line Transformers — ARRL	BX329	$40.00
Vertical Antenna Handbook — Lee — 1990	BX284	$22.00
Yagi Antenna Design — ARRL	BX164	$30.00
ATV		
An Introduction Amateur TV	BX389	$20.00
The ATV Compendium — BATC	BX270	$17.50
The Best of CQ-TV volume 2	BX273	$17.50
CALL BOOKS		
Radio Call Book International 1993	BX339	$49.95
Radio Call Book North America 1993	BX338	$49.95
FICTION		
CQ Ghost Ship — ARRL	BX204	$10.50
Death Valley OTH — ARRL	BX205	$10.50
DX Brings Danger — ARRL	BX206	$10.50
Grand Canyon QSO — ARRL	BX207	$10.50
Murder By QRM — ARRL	BX208	$10.50
SOS At Midnight — ARRL	BX209	$10.50
HANDBOOKS		
ARRL Handbook — 1993	BX369	$52.90
Electronics Data Book — ARRL	BX201	$24.00
Mobile Radio Handbook	MFJ33	$24.95
Motorola RF Device Data — 2 Volumes	BX047	$35.50
Radio Communication Handbook — RSGB	BX266	$56.00
Radio Theory For Amateur Operators — Swainston — 1991	BX367	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BX439	$47.00
World Radio TV Handbook	BX450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BX198	$8.00
50 Years of the ARRL — 1981	BX196	$8.00
Big Ear — Autobiography Of John Kraus W8JK — 1975	BX263	$12.95
Bright Sparks of Radio — RSGB	BX394	$44.00
Dawn of Amateur Radio	BX395	$58.00
Golden Classics of Yesterday — Ingram	MFJ30	$21.50
Spark to Space — ARRL 75th Anniversary	BX310	$25.00
INTERFERENCE		
Interference Handbook — Nelson — 1909	BX181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BX186	$30.00
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$10.50
Design Note Book W1FB — ARRL	BX357	$20.00
Farrells Confidential Frequency Listing	BX387	$42.00
Ferromagnetic Core Design & Application Handbook	BX135	$77.00
First Steps in Radio — Doug DeMaw W1FB	BX385	$14.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BX441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BX308	$20.00
Hints and Kinks 13th edition — 1992 — ARRL	BX330	$27.00
National Educational Workshop 1991 — ARRL	BX384	$24.00
Novice Notes, The Book — QST — ARRL	BX298	$12.00
QRP Classics — ARRL — QST	BX323	$24.00
QRP Note Book — DeMaw — ARRL	BX170	$20.00
Radio Astronomy 2nd edition — John D Kraus — 1986	BX262	$79.90
Radio Auroras — RSGB	BX381	$28.00
Radio Buyers Source Book — ARRL	BX377	$30.00
Shortwave Receivers Past and Present	BX253	$22.00
Solid State Design — DeMaw — ARRL	BX171	$24.00
Vibroplex Collectors Guide	BX025	$45.00

	Ref	List Price
MORSE CODE		
Advanced Morse Tutor — 3.5" Disk	BX328A	$40.00
Advanced Morse Tutor — 5.25" Disk	BX328	$40.00
Morse Code — The Essential Language	BX223	$10.00
Morse Code for Radio Amateurs — RSGB	BX451	$16.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BX331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BX332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BX333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BX334	$18.50
Morse Tutor 3.5" IBM Disk	BX187A	$20.00
Morse Tutor 5.25" IBM Disk	BX187	$20.00
OPERATING		
Amateur Radio Awards Book — RSGB	BX297	$30.00
Amateur Techniques — G3VA — RSGB	BX393	$30.00
DXCC Companion — How to Work Your First 100	BX345	$12.00
DXCC Country Listing 4- ARRL	BX386	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BX379	$18.00
Locator Map of Europe — RSGB	BX396	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BX202	$7.00
Low Band OXing — John Devoldere	BX195	$20.00
Operating Manual — ARRL — 4th Edition	BX192	$36.00
Operating Manual — RSGB	BX359	$31.00
Passport to World Band Radio	BX346	$34.00
Prefix Map of North America	BX235	$8.00
Prefix Map of the World — RSGB (laminated)	BX397	$25.00
RTTY Today — a Guide to Amateur Radioteletype	BX003	$18.00
Short Wave Propagation Handbook	BX288	$22.00
The Complete DXer — W9KNI	BX194	$20.00
Transmitter Hunting	BX222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BX197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BX178	$21.00
Gateway to Packet Radio 2nd edition — ARRL	BX169	$31.50
Packet Computer Networking Conference 1-4 1982/5	BX188	$36.00
Packet Computer Networking Conference No 10 1991 — ARRL	BX378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BX187	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BX186	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BX184	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BX295	$20.00
Packet Radio Made Easy — Rogers	MFJ32	$20.50
Packet Radio Operator's Manual — Rogers — 1993	BX43	$37.50
Packet Radio Primer — G8UYZ — RSGB	BX440	$28.00
Packet Users Notebook — Rogers	BX285	$18.50
SATELLITES		
Oscar Satellite Review — Ingram — 1988	MFJ31	$17.00
Satellite AMSAT 5th Space Symposium — ARRL	BX152	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BX199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BX453	$25.00
Satellite Anthology — 1992 Edition — ARRL	BX180	$20.00
Satellite Experimenters Handbook	BX177	$40.00
Space Almanac — ARRL	BX299	$50.00
Weather Satellite Handbook — ARRL	BX324	$51.00
Weather Satellite Handbook Software 5.25" IBM Disk	BX326	$20.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio — Orr	BX216	$25.60
International VHF FM Guide — G3UHK — RSGB	BX399	$14.00
Microwave Handbook Vol 1 — RSGB	BX318	$38.00
Microwave Handbook Vol 2 — RSGB	BX437	$57.00
Microwave Handbook Vol 3 — RSGB	BX447	$57.00
Microwave Update Conference 1987 — ARRL	BX174	$17.50
Microwave Update Conference 1988 — ARRL	BX183	$17.50
Microwave Update Conference 1989 — ARRL	BX321	$24.00
Microwave Update Conference 1991 — ARRL	BX446	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BX175	$18.50
Spread Spectrum Source Book — ARRL	BX385	$51.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$75.00
UHF Compendium Part 3 & 4 Vol 2	BX251	$75.00
UHF Compendium Part 5 German Only	BX354	$82.50
UHF/Microwave Experimenters Manual — ARRL	BX325	$51.00
UHF/Microwave Experimenters Software — ARRL	BX327	$26.00
VHF 21st Central States Con. 1987 — ARRL	BX172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BX268	$18.50
VHF 24th Central States Con. 1990 — ARRL	BX322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BX438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BX448	$25.00
VHF West Coast Conference 1992	BX444	$31.50
VHF/UHF 18th Eastern Conference — ARRL	BX445	$25.00
VHF/UHF Manual — RSGB	BX267	$40.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$18.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Bumper Stickers		$0.50
WIA Car Window Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1994		$12.50
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

Pioneer Trek By Horse

J P Mahoney VK4JON *

Four hundred kilometres on horseback is a long way to ride, even if you do it over 5 days. With a veterinary checkup twice a day, you need to have your horse in peak condition to continue in the event. And what about the safety aspects of the ride? How do you get help if something happens? It might be just a lost shoe. That could make your horse lame on the stony bits.

Well, one solution to the problem of safety might be to enlist the aid of your local Amateur Radio Club. That's just what the Far North Endurance Riders Association did. Based, roughly, on the Atherton Tablelands, the Association holds eight events each year, with the Pioneer Trek the largest. Over the last two years it has been held during the June school holidays, making it a bit difficult to enlist sufficient operators to do the job. A change has been mooted for next year.

Bob VK4ZZB and Stan VK4ZRO, being the only operators with "conventional" vehicles, were assigned to help me man the base station. Brian VK4BGS had a 4WD, but his health prevented him "going bush". His operating skills at the base kept us all on our toes for the three days he was with us, and his acid wit kept us sharp. Ted VK4YG brought along his trusty VW Kombi, not exactly a conventional vehicle when you consider the places he turned up for duty. Ron VK4ACZ turned up out of the blue on Monday night, ready for the 5 am start on Tuesday morning. I had changed my phone number in the recent weeks, and Ron missed out on the advice.

Lack of activity on the Tablelands repeater, VK4RTA didn't wise him up to the fact that his HT was on the blink, but a loaned set soon had him on air again. Stan VK4MFA found he had 4WDriving skills he didn't know he possessed when I sent him "over the hill" to one spot. It's amazing how 2 metres gets out of some of these places.

Here was Stan VK4MFA (we had two Stans and two Johns) way down in a very steep ravine, in stony, sandy desert type of country, having no trouble accessing the repeater which was sited in rain forest on the top of a ridge a good 20 km away. That road was so steep he had to use low range 4WD and he swore he would not cross it twice. Adolf VK4DHF had his first taste of Endurance Ride operation, but he soon got the hang of it.

We had a first hand example of what not to do when one of the riders got into difficulties, and needed help. As with most situations of this sort, the first rule is "Stay put, when you send for help". This chap didn't, and as a result the rescue vehicle went looking for him, and we thought it had got lost, too. The rescue vehicle didn't have an amateur operator on board, and for a while things looked grim.

When the rescue vehicle got as far as it could go, and still couldn't locate the rider, the driver set out on foot to look for him. It was nearly panic stations, I can tell you, because my wife was also in the vehicle. It all turned out OK, though.

The weather did nothing to help. Back at camp, it was alternately raining, or blowing a gale, or both. Over on the other side, a ridge or two away, the mercury was in the high twenties, with bright sunshine all around. Up around the repeater site, Longlands Gap, dense clouds hid everything from view. Height above sea level was about 1000 metres, give or take a hundred metres or so, and was not the warmest in June.

Wilf VK4ZNZ spent his first night on that outing in a little pup tent. XYL Helen soon put a stop to that caper. They went home next day for the pop top. John VK4VKL, being a hardy soul, was firmly ensconced in his swag for the duration, but within warming distance of a good fire.

I had spent some time on reconnaissance during the weeks leading up to the Ride, so was able to divide my time between base operation and mobile work. It was a case of doubling up where needed, as we did not have enough operators some of the time.

The operating side of things made for some interesting observations. Apart from Stan VK4MFA's experience with the ravine, even with 10 watts, in some places operators had to move their vehicles away from the checkpoint to contact the repeater. Yet the checkpoints were placed on the basis that contact with the repeater was possible from that particular point. In some instances the move was of the order of 5 or 10 metres, but in one case a move of 10 centimetres meant the difference between getting the message back, or not.

The tracks were many and varied. On one leg the riders found themselves in what was, to all practical purposes, desert country, only to have the scenery change in less than 10 kilometres into lush rainforest. Certainly enough diversity to keep one interested.

When the time came to do a "Bang-tail Muster", we had 10 operators, but such were their commitments elsewhere, every time we looked around, we seemed to be one shy, so leap-frogging of checkpoints became the order of the day.

Funny people, these Endurance Riders. The Salt of the Earth. They are preserving, as a sport, what to our fathers was a way of life. *"Struth, I can remember riding a horse 40 miles to a dance in the bush. We'd leave the station after lunch on Saturday, and get home Sunday afternoon. Dance all night, too. That was only 40 years ago.*

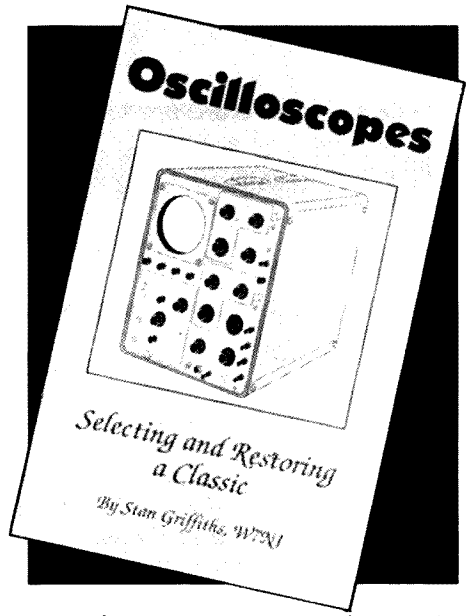
Remember the saying, "You don't have to be mad, etc.... but it helps?" I'm going to alter that. You do have to be mad! To do what, you ask? Well, certainly you have to be a bit mad to be an Endurance Rider, and maybe, too, to be in Amateur Radio.

**PO Box 194, Innisfail, Qld 4860*

ar

Book Review
Oscilloscopes
Selecting and Restoring a Classic

By Stan Griffiths W7NI
Reviewed by Evan Jarman VK3ANI



This book is intended to help the buyer of a classic Tektronix oscilloscope get the best buy for his money and make the most of his investment. So states the author when outlining the use of this book. This is certainly not a book on the theory and operations of an oscilloscope. It has been written as a buyer's guide for those in love with old Tektronix oscilloscopes.

The price of modern test equipment usually puts the amateur in the second hand or surplus market. This is a market where *caveat emptor* is a bylaw of life. The selection of good, or potentially good, equipment from surplus sources is a risky business. This book describes oscilloscopes built in the 50's, 60's and 70's when the founder of the Tektronix company was still influencing the designs. It describes separately each oscilloscope, plug in unit (time base, amplifier, etc) and even a couple of sampling heads. The descriptions are basic but also include a picture, any warning caution or special consideration, a recommendation and prices (US$), as well as current market value. This last item shows how real depreciation is in test equipment. The current market value was approximately 5% of the last listed catalogue price. When allowing for the deflated buying power of money it is easy to see that you would not buy these as an investment.

The author is to be commended for his recommendations. Quite often he suggests against purchasing a particular unit "unless you are into antiques". For someone who clearly loves the brand it is refreshing to see his objective appraisal. Special equipment such as vectorscopes include a paragraph outlining the purpose of the item suggesting that it would not be of much use for anything else.

The book also offers a variety of tips for restoring this equipment, ranging from cleaning methods to restoring appearance, to electrical modifications to restore performance. Information that is applicable to any surplus equipment. Some replacement part number information is also included but this is unique to Tektronix equipment. The book also includes the brand names of some "counterfeit" instruments which the author describes as "vastly inferior"; remember *caveat emptor.*

The book is clearly aimed at the American market which is large enough to support a secondary trade in brand test equipment. Europe could also be large enough but Australia would not. This is a specialised book to support a niche trade. It is doubtful that this book would be generally available in Australia. This is not to say that there would not be an individual interested, in which case they should contact the author who is also the publisher.

The review copy came from the author.

Paperback 140 by 237 mm.
372 pages

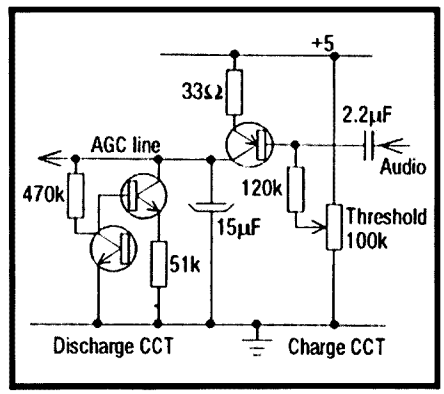
ar

A Different Type of AGC Circuit

*Jon Lindstad, VK2WF * provides some comments on AGC*

Most receiver AGC systems use a resistor to discharge the agc holding capacitor. The "decay time" is determined by the time constant of the R-C combination. One problem with this arrangement is that, due to the exponential discharge rate, the AGC voltage will drop rather quickly to start with, and then more slowly. Ideally it should be the opposite, with the AGC voltage dropping slowly to start with, and then faster. The circuit described below, which I have been using in a homebrew rig, is an improvement on most existing systems as it uses a "constant current sink" to provide a constant rate of discharge.

The "attack" or charge rate is determined by the 33 ohm resistor,



and the "decay" or discharge rate by the 51 kohm resistor. These values may be varied to suit your application. Any suitable, garden variety transistors will do the job.

* *PO Box 457, Armidale NSW 2350*

ar

Teaching Transformers Long Ago

John Allan VK5UL mixes nostalgia with a small dose of theory*

For many years following WW II I conducted theory classes for would-be amateur and professional radio operators. As a result I had the opportunity to observe the major stumbling blocks encountered by students.

Many students had difficulty in understanding the subtle difference between resistance and reactance in an AC circuit, the characteristic impedance of a transmission line and last, but not least, the "impedance ratio" of a transformer. It was this last feature which they had the greatest difficulty in comprehending.

They had no trouble memorising the formula — Z ratio = turns ratio^2 (or voltage ratio^2). A contributing factor to the problem was due to the fact that the technical literature available to the average novice operator was limited in its definition.

The problem arises as a result of examiners, having stated certain parameters in the secondary circuit of a transformer, then setting the question: "What is the primary impedance?", when the question should read "What is the impedance reflected across the primary winding?". I could be accused of splitting hairs but once a student understands this interesting characteristic of a transformer he no longer worries how an open circuit primary can have a measurable impedance.

The above brings me to the prime reason for writing this article. That is to draw the attention of students to the fact that the impedance ratio of the transformer is also the reactance ratio. What follows is an attempt to present an interesting application of this phenomenon which is rarely, if ever, used today, but which was once used extensively in the valve era — the vibrator power supply.

It was during the late 20's that I took the first hesitant steps towards climbing the bottom rung of the radio ladder. It was also about this time that the first American-made car radios were becoming available locally. It was during this period that I first encountered the vibrator power supply. This device converted the 6 volts available at the car battery to 180 volts DC for the valve anodes/plates.

The mechanical vibrator chopped the DC into a spiky square wave AC.

This was an exciting period for a teenager. The 4 pin valves gave way to 5 pin then, in quick succession, to 6 pin, small 7 pin, large 7 pin and 8 pin; electrolytic (liquid) capacitors appeared, the superhet receiver arrived; the crystal filter; crystal controlled transmitters; a variety of exotic transmitting aerials; knowledge of sunspots and HF propagation was beginning to filter through to the layman; and Litz wire and Sirufer iron dust cores became available. (I could not believe the reading on our Boonton "Q" meter when I first tested a combination of 9/41 Litz and a Sirufer pot core). This with one night "wireless" theory and one night practical classes per week left little time for mischief. Well — some mischief — a little pirating on 5 metres.

I first attempted to service a car radio circa 1930. I was intrigued by the vibrator power supply and, in particular, a 0.008 μF mica dielectric capacitor (1000 volt rating) mounted across the secondary of the transformer. Even after tracing a circuit diagram I still had no idea how it functioned. For some time I pestered the "Old Timers" for clues and eventually was able to piece the picture together.

The mechanical vibrator chopped the DC into a spiky square wave AC. To keep the load on the vibrator to a minimum it was essential that the primary circuit had the correct frequency of oscillation. In effect it was desirable that the vibrator coupled into a non-reactive or resonant load. Now the primary winding had very few turns, hence the inductance was no more than a few μH. The vibrator was designed to have a frequency of 100 Hz therefore the primary X_1 was quite small but of sufficient magnitude to cause some "ringing" after the vibrator contacts opened. As only a small degree of X_c would be required to resonate with the primary X_1 at 100 Hz, the associated capacitor would need to be quite large and, bearing in mind that only paper or mica dielectrics were available, the cost would be excessive.

I don't know who the genius was who decided to make use of the reactance ratio of the transformer to solve the primary capacitor problem by installing a "Timing" or "Buffer" capacitor across the secondary winding — in this case a 0.008 μF capacitor (X_c at 100 Hz = 200 kΩ). Bearing in mind that the transformer ratio is 30 (180/6), then the reactance ratio is 900 (X ratio = E ratio^2). Hence the reactance reflected across the primary is 200 k/900 = approx 220 Ω. At 100 Hz this resolves into the equivalent of a capacitor of about 8 μF. A capacitor of 8 μF (400 volt working) would have been too large

and too expensive to be practicable. The vibrator was quite happy to work into a load made resonant by a capacitor which did not physically exist (across the primary). Incidentally the 1000 volt rating of the 0.008 μF capacitor was necessary to take care of the voltage spikes.

Overall, an interesting application of the reactance ratio as exhibited by a transformer and an interesting piece of equipment from a bygone era. The vibrator power supply had many other applications. One I remember converted 32 Volts DC to 240 volts AC for use on farms. Another, used by a professional photographer, converted 4 volts to 2000 volts to fire the flash. The vibrators in German made units were labelled "Zerhacker" which loosely translated means "chopper-upper". DC-DC converters are, of course, still in use today, but low frequency mechanical vibrator switching has been replaced by semiconductors operating at a much higher frequency.

Eventually car radios and domestic receivers for operating from 6 and 12 volt batteries were produced by the tens of thousands in this country, the majority using the mechanical vibrator. A particularly efficient vibrator designed for use with domestic radios had synchronous secondary contacts on a split reed arrangement which mechanically rectified the transformer secondary voltage, thus eliminating the need for a power consuming rectifier valve.

The years 1929 to 1960 were a period of continuous rapid change, but with effort one could keep a finger on the pulse of developments. The mind boggles at the rate of change from 1960 to date. I never cease to marvel how young people, breaking into the industry are able to cope. It would appear that the only hope of success now is to specialise.

27 Devonport Terrace Ovingham SA 5082

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

DIGICOM with an AAPRA Modem

Murray Burford VK5ZQ describes how he solved the problem of using Digicom software with his C64 computer and an AAPRA modem.*

I had been reasonably satisfied with the software AAPRA had supplied with their modem kit for packet and saw little need to try DIGICOM, which many amateurs seemed to be using.

A copy of DIGICOM had been given to me but, as the AAPRA modem transfers its data via the user IO port of the C64 and DIGICOM uses the C64 cassette port, there was a compatibility problem.

While I was a little intrigued to try DIGICOM with the AAPRA modem, real motivation didn't come until another amateur decided to give packet a go, maybe following a little prompting. He had purchased a local modem kit and opted for DIGICOM.

Well, I could make quite a story out of my efforts to use the AAPRA modem. Using incomplete information, conflicting information and not really knowing what I was doing, I came to know frustration and a few new words.

However, with input from VK2AUQ, VK5RG and VK5ZAH, an adaptor was built to plug into the AAPRA modem and the C64, using the connections as shown in Fig 1. Now everything works fine!

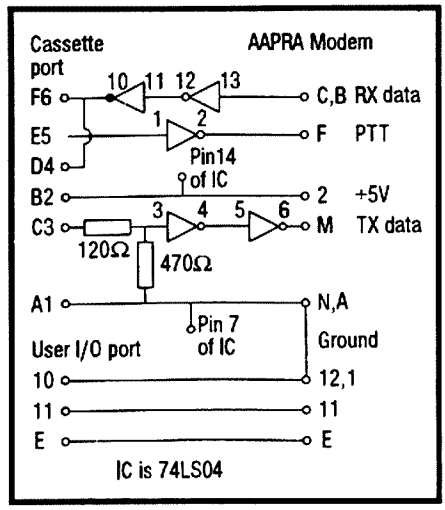
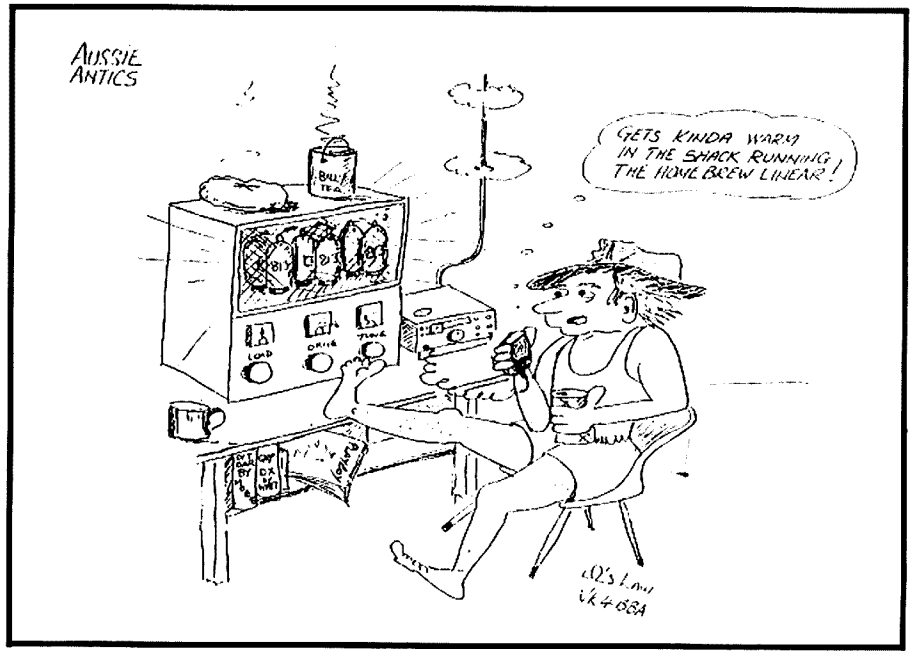


Fig 1

The AAPRA modem comes in a neat die cast aluminium box. The adaptor requires a double sided piece of pc board edge connector.

261 Belair Road Torrens Park SA 5062

ar



ALARA

*Robyn Gladwin VK3ENX **

LETTER TO MARGARET

Margaret Loft, VK3DML,
ALARAMEET Co-ordinator,
Castlemaine. Victoria.

Dear Margaret,

On behalf of all ALARA members and friends, I would like to extend sincere thanks to you for your wonderful work in organising the 1993 ALARAMEET.

It is no easy task to book suitable accommodation, arrange venues and suggest activities for over 80 people. You accomplished all this in a most efficient manner, but you also added the extra touches such as the hand embroidered name badges and memento ribbons for the YLs and the souvenirs of Castlemaine for the OMs. Participants appreciated the clear maps of the area which you provided and you deserve congratulations for keeping the program running smoothly throughout the entire weekend.

Please also thank the members of your team, Ron Atkins VK3BYM, Judy Atkins VK3AGC, Ray Taylor VK3FQ, Michelle Taylor VK3NSU, Colin Eyre VK3CWE, Graham Sutherland VK3AGS, and Pam Carter for their catering expertise; Annette Whyte, Kay Fairbairn and yourself for expert embroidery skills; Geoff Cartwright VK3NTN, for being the official photographer; Erika Bartz VK3AEB, for her work on the programs and Jenny Adams VK3MDR, for making and decorating the ALARAMEET cake.

Finally, we would like to thank your husband, George VK3AGM, and the other members of your family, for the support and encouragement they have given you during the past three years.

I am sure that the radio amateurs from three New Zealand call areas, including the President of WARO, Dawn Young ZL2AGX, and those representing five Australian states, will long remember the 1993 ALARAMEET in Castlemaine which you made possible.

33 Robyn

WOMEN IN RADIO

Heather Pike VK2HD

Heather's first experience of radio operating was as a wireless telegraphist in the Air Force during World War 2 from 1942 to 1945. After the war Heather was busy on the home front with the usual domestic situation and did not carry on with radio until taking out an amateur licence in 1961 with her present call of VK2HD.

Heather Pike, VK2HD, operating her amateur station.

Her husband Ron had the call of VK2ACU, and the two of them could be heard operating on all bands while chasing local and DX contacts. After Ron became a Silent Key, Heather was kept busy on air by all her DX friends.

In 1975, when the ladies' organisation was formed, Heather was one of the founding members. She has been a continuous member of ALARA and has helped the club grow worldwide by sponsoring many overseas members into it. During 1976/77 Heather was the treasurer and she willingly supported ALARA when they held the callsign VI88WIA during Australia's Bicentennial Year.

Heather's station is a very neat set up in one corner of the house with a magnificent antenna array that would be the envy of any city dweller. However, she does have problems. Being in the dry north-west, her antennas are exposed to severe winds and rip snorter thunderstorms. Another problem puts Heather off the air each evening — birds! Sometimes there are over 250 galahs perched on a very drooping beam at sunset. The distributed capacitance puts the antenna off tune and the VSWR rises considerably.

While Heather has over 307 countries confirmed, she has only recently applied for her DXCC. Despite this, tucked away in a large filing system is a very large collection of all sorts of awards from many countries.

Heather has done a great deal for women in amateur radio by extending the hand of friendship to all amateurs on the bands. She can be heard on air every day, often assisting others to make contacts with rare countries on various DX nets, maintaining her regular contacts and occasionally running the DX nets when the usual operators are unable to be on air. She embodies the true amateur spirit in her operating techniques and her willingness to help others.

Raidie Fowler

Raidie, pictured attending one of the VK3 luncheons, joined ALARA in November, 1976. She was Vice President from 1978 to 1979, and President until October, 1981. All VK3 ALARA Birthday lunches have been held at her home since the 12th Birthday of the Association in 1987.

Raidie Fowler at a VK3 luncheon in July 1993

Raidie and her husband, Ray VK3BHL, have 3 children and 8 grandchildren. Their ancestors, the Allnutts and the Fowlers, arrived in Australia in 1854 on the ship "Grand Trainon", never realising that their great grandchildren would one day meet and marry.

ALARA members would like to acknowledge the contribution Raidie has made to amateur radio and thank her for her encouragement and support over the years.

**PO Box 438 Chelsea 3196 VK3ENX@VK3YZW*

ar

AMSAT Australia

Bill Magnusson VK3JT *

Four new amateur radio satellites launched

A dramatic night time launch from Kourou at 01:45 UTC on 26th Sept 1993 with the launch window almost closing saw an ARIANE launch vehicle lift off to carry seven satellites into orbit. Of these seven satellites, four are of general interest to radio amateurs.

POSAT-1 is a 50 kg satellite built by Surrey Satellite Technology Limited (SSTL) of the University of Surrey, for LNETI (Portugal). Its mission is to receive and transmit earth images, determine its position using GPS, make radiation measurements, and receive and forward messages.

Uplink: 145.925/145.975 MHz
Downlink: 435.250/435.275 MHz (435.250 MHz is the primary frequency)
Speed: 9600 bps (38.4 kbps probably)

KITSAT-B is a 50 kg satellite built by Korean Advanced Institute of Space Technology (KAIST). Its mission is to take CCD pictures, process numerical information, measure radiation, and receive and forward messages.

Uplink: 145.870/145.980 MHz
Downlink: 435.175/436.500 MHz
Speed: 9600 baud

EYESAT-A is 12.5 kg and was built by Interferometrics (USA). Its mission is experimental monitoring of mobile industrial equipment. It also carries an amateur radio payload which has the following frequencies:

Uplink: 145.850 MHz
Downlink: 436.800 MHz
Speed: 300 — 9600 baud

ITAMSAT is a 12 kg satellite built by AMSAT-ITALY. Its mission is to store and forward Amateur Radio messages in a similar manner to AO-16, LU-19, KO-22, and KO-23. Its transponder frequencies are as follows:

Downlink:	435.867 MHz (primary)	PSK 1200 baud
	435.822 MHz (secondary)	PSK 1200 baud
		AFSK 1200 baud (FM)
		9600 baud (G3RUH)
		analog transponder (FM)
Uplink:	145.875 MHz 1200 baud	Manchester/4800 baud
	145.900 MHz 1200 baud	Manchester/4800 baud
	145.925 MHz 1200 baud	Manchester/9600 baud /exper
	145.950 MHz 1200 baud	Manchester/9600 baud

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

At the time of writing good telemetry is being received from all these new amateur satellites and the latest kep sets already contain their elements. Since they were all launched at once they have been allocated consecutive OSCAR numbers according to the date on which it was first announced they would be built.

Good news regarding UO-11

Controllers at the University of Surrey have been successful in regaining command of the UoSAT-2 spacecraft after a short period off-air. The "command lost timer" timed out at roughly 18:37 UTC on Saturday 18 September and during the next pass over the UK controllers were able to command the spacecraft to turn on its 70 cm beacon. An examination of telemetry showed that the spacecraft is in good health. Every effort will be made to return UO-11 to an operational state as soon as possible.

Bad news regarding ARSENE

It seems the amateur satellite fraternity has lost ARSENE. It was reported recently that, just as the instructions were about to be transmitted which would have put ARSENE into a temporary shut-down mode, the transmissions from the satellite ceased of their own accord and have not been heard since. Control stations put in a concentrated effort to restart the transmitter but to no avail. ARSENE had been plagued by problems from the time it was launched. Although the launch went smoothly and the orbit is by far the best of any amateur satellite the orientation has been a problem. It was very selective as to the MA times when signals could be heard indicating attitude difficulties. The mode B transponder failed shortly after turn-on and despite concentrated listening efforts by many well equipped stations it was never heard again. This left only the mode S system operating. Due to the frequency being nearly 50 MHz away from the usual 2.4 GHz satellite band many stations were unable to use this mode until they updated their equipment for the ARSENE frequency. Up to the time of the failure more and more stations were doing just that and ARSENE was responsible for the biggest ever upsurge of amateur activity in the 13 cm band. It's a great pity that it has failed. Southern hemisphere amateurs in particular will mourn its passing. The high altitude, equatorial orbit was the first which did not favour the northern hemisphere and it put all amateurs, world-wide on an equal footing as far as access was concerned.

Good conditions on OSCAR-13

Recently we have seen a couple more rounds of excellent conditions on OSCAR-13. The windows from the south eastern VK states into Europe have been long, productive and at fairly friendly times. I have a number of friends who are not satellite operators but are VHF/UHF DXers. When ever we are coming into a set of conditions like that I always alert them. They have large high gain antenna arrays and although they can't elevate them this is of little consequence as the windows from Melbourne to London never exceed 8 or 9 degrees elevation, well within the beam of these antennas. I supply them with the appropriate data on times and azimuth bearings and off they go. These sessions are always

eagerly awaited and talked about long afterwards. Try this if you have friends with reasonably good antenna systems. You could easily see them becoming interested in entering the satellite field seriously. The recent round saw windows of several hours and squints right down to 1 or 2 degrees. Remember, OSCAR-13 is slowly coming south. At last report its apogee was at 28.7 degrees north and moving south at about 0.054 degrees per day. At that rate it will be over the equator in about 530 days, that is about the middle of 1995. As predicted the perigee height of OSCAR-13 has risen to 810 km from its low last year of some 600 km. Unfortunately this will not continue for much longer. The computer models predict it will soon begin to fall and plunge deep into the atmosphere in 1996. So enjoy it while you can, at least we can look forward to improving conditions right up to the end.

A NEW CONCEPT

Ground station location/tracking using amateur satellites and packet radio

A number of accounts are to hand on this subject in which a BText broadcast from packet stations can be used to locate and display their positions on a map when digipeated through an amateur satellite. More on this next month.

`359 Williamstown Rd, Yarraville VIC 3013
Packet: VK3JT@VK3BBS
ar

WICEN

News from WICEN (NSW) Inc

The most important event in November is the Big NSW/Vic Bike Ride, starting on 27th November and ending on 12th December. This is a large-scale exercise, and Simon VK2CSC requires as many people as possible, even if they can only spare a day or so.

At the time of writing, only a few volunteers from VK2 have come forward, and it appears that VK3 will be running the show! Further information on this event can be obtained from your co-ordinator, or from Simon VK2CSC@VK2CZZ (packet) or (049) 50 4432 (after hours).

The address of WICEN (NSW) Inc is PO Box 123, St Leonards, 2065. WICEN (NSW) conducts nets at various times; the only one I know about is the Sydney VHF Net every Thursday night at 2130 local time on repeater 7150 in Chatswood.

Dave **Horsfall VK2KFU**
Publicity Officer WICEN (NSW)
ar

AWARDS

John Kelleher VK3DP — Federal Awards Manager

ALARA Award

This Award is available to YLs, OMs and SWLs for contacting ALARA members on or after 30th June 1975, as follows: VK/ZL: 10 contacts, including 5 Australian Call Areas; and DX: 5 contacts, including 4 Australian Call Areas. All contacts must be made from the same Call Area. Repeater contacts and official ALARA net contacts do NOT qualify. Special endorsements are available for Mixed, CW, Phone, All 28 MHz etc, etc. Endorsement stickers are available for each 10 (DX 5) additional members contacted.

Applicants must submit a log extract certified correct and signed by two other amateurs, under the following headings: Date, Time UTC, Band, Mode, Callsign and name of ALARA member contacted, report sent, and report received. In lieu of certification, QSL cards must be forwarded. Full name, address, signature and callsign of the applicant are required. Fee (to accompany application): 3 Australian dollars, or 4 IRCs. Additional stickers can be applied for at a later date, costing $1.00 Australian per application.

Applications to: ALARA Awards Custodian, Jessie Buchanan VK3VAN, 4 Milford Crescent, Karingal, VIC, 3199, Australia.

YL Awards

The following is a list of YL Awards extracted from the K1BV Awards Directory for 1992.

ARGENTINA: LU-YL: Contact 5 LU YL operators. No restrictions as to time and band. Fee of US$5.00 to:- Award Manager, Radio Club of Argentina, PO Box 1127, Buenos Aires 1000 Argentina.
BELGIUM: BYLC: Issued by the Belgian YL Club. All bands and modes. VK need 15 points. YL members of UBA count for 3 points, while non-members count 1 point. GCR list, and a fee of US$5.00 to:- Varelst Mia, ON6OW, Antwerpstrasse 141, B-2500 LIER Belgium.
CANADA: CLARA: Work 5 YL stations in 3 Canadian call areas (limit 2 VE3) all bands. Endorsements available. Fee is CAN$2.00 to:- Cathy Hrischenko VE3GJH, 56 Stockdale Crescent, Richmond Hill Ontario L4C 3S9 Canada.
FINLAND: FINNMAID: Contact 3 Finnish YL stations.Fee US$3.00 to:- SRAL Award Manager, Jukka Kovanen Varuskunta 47 as 11, RIIHIMAKI 31 SF-11310 Finland.
FRANCE: DIPLOMA des YL's de FRANCE: Proof of contact with 5 French YL stations and one on 3 different continents.(8 cards). Fee US$6.00 to:- Gilda le Ball, Quilvidic — Mellac, F-29130, Quimperle France.
JAPAN: YL-CW-AJD: Contact a licensed YL in each of the 10 districts (JA1-0). GCR list and fee of 10 IRC to :- Nobuko Nishigori JA3UPR, 2-6-11 Hirosedai, Kaai-machi, Kitakatsuragaigun, NARA-ken 636 Japan.
NEW ZEALAND: WARO: Work 12 members of WARO. No fee mentioned,but postage required for return of certificate. GCR list to:- Vicki Shaw ZL1OC, PO Box 2088, Whakatane, NZ 3400.
SWEDEN: YL-NINGEN: Work 7 Swedish YL's. GCR list and 3 IRC to :- Vastkustens YL Group SK6QL, Box 6015, S-424 06, Angered, Sweden.
USA: DXCC-YL: Contact licensed YL's from 100 DXCC countries on any authorised bands. Fixed or Mobile contacts OK. No cross-band contacts. GCR list in alphabetical order of ARRL countries list. List must include country, callsign, date, time, frequency, RS/T and YL's name. No fee mentioned, but include return postage.Apply to:- DXCC-YL Certificate Custodian, 3118 Eton Road, RALEIGH NC 27608 USA.
USA: WAC-YL: Contact one YL operator in each of the 6 continents, Europe, Asia, Africa, North America, South America, and Oceania. All bands and modes. You may send the cards or double-sided photocopies of the cards. GCR list accepted if signed by 2 YLs or a Club Officer. Fee is US$2.00. Apply to:- Leanna Shaberley KB8RT/7, 2635 W Sunrise Drive, Phoenix AZ 85041 USA.
USA: WAS-YL: Contact a licensed YL operator in each of the 50 US states. DC may be substituted for Maryland. GCR list in State alphabetical order, including all QSO details and the YL operator's name. Fee is 3 IRC. Apply to:- Richea Brigance KU5L, Rt 2 Box 197, Booneville, AR 72927 USA.

In conclusion, the **USA-XYL** Award. Any OM may nominate his XYL for this special certificate, which recognises the "aid and comfort during contests, field days, late QSOs, dying bands, and heavy QRM". It further recognises her brave disregard for personal safety in periodically cleaning your shack. Apply with XYL's name and a fee of US$2.00 to:- Elizabeth S Clark W4GGQ, 41 Lenape Drive, Miami Springs, FL 33166 USA.

Gwen Tilson VK3DYL

Gwen was first licensed as VK3PGT in December 1980, after a few gruelling months "'schooling" by her OM Tom VK3KFW and son David, now VK3UR. "They had a pretty dumb pupil" Gwen recalls "and there was a loud, collective sigh of relief when the results came through."

Two days after getting on air (using David's FT7 and a long wire) a rare DX station called Gwen for a chat — it then gradually dawned on her that having a YL's voice could prove a distinct advantage in DXing, particularly in dog-piles. And so Gwen started on that long, long haul to the DXer's ultimate goal of working all current DXCC countries. Now, 12 years on, this ambition has been achieved with a lot of fun along the way.

The first step was to upgrade her licence (which she did as soon as she had worked DXCC) to VK3KYL, and then VK3DYL. The station has also been upgraded to a TS430S and TH3, helped occasionally by an FL2100Z amplifier.

In between chasing new countries and chatting to friends all round the world, Gwen has enjoyed using special VK callsigns, sorting cards for the VK3 Inwards QSL Bureau, acting as QSL Manager for a VK0 friend, helping with JOTA and operating portable W3, W6 and KL7. Last year she visited ARRL HQ and received her Honor Roll plaque. She also holds DXCC-YL, which took her 10 years to work!

Gwen is grateful to all who have helped her — from the "DX spotting gang" on 2 m to the friendly net controllers and the anonymous voices who have asked rare DX stations to "listen for the VK YL calling you." Her family has suffered patiently the erratic times for meals when the DX is coming in, and David's agility on the roof fixing antennas has been invaluable. Gwen's only complaint is "Why didn't someone tell me about amateur radio years ago?"

**PO Box 300 Caulfield South 3162*

ar

Sign up a new member today — We need the numbers to protect our frequencies and privileges.

CLUB CORNER

Adelaide Hills Amateur Radio Society (AHARS)

The AHARS annual electronic sale will be held on Saturday November 13 between the hours of 9.30 am and 2.00 pm. The venue is the same as for previous years at the Westbourne Park Memorial Hall, 390 Goodwood Road, Westbourne Park. The hall is about 300 metres south of the Cross Road intersection. All radio amateurs and others interested are invited for a day of trading fun. This is the day to get rid of that surplus gear or to find the odd special component you need.

Those interested in selling gear must book table space and this can be arranged by ringing Geoff Taylor VK5TY on (08) 293 5615. The doors will be open for trading at 9.30 am but vendors should present themselves at 8.30 am to prepare their tables. The club will charge a commission of 10% of gross sales with a maximum of $10 on any one item. This assists to offset the cost of hiring the hall and other expenses. All sales are by negotiation between the buyer and seller.

Refreshments will be available within the hall. Test equipment and an operator will be available to carry out simple checks on components.

Lloyd Butler VK5BR
Vice Pres AHARS

Australian Naval Amateur Radio Society

For those who missed the operations of ANARS club stations VK1SEA, VK2SEA and VK1VHP during Navy Week 1993, the operation will be repeated on two days during November to commemorate significant events in the history of the Royal Australian Navy.

Tuesday November 9: Anniversary of the WW1 battle between the Australian light cruiser HMAS SYDNEY (1) and the German cruiser SMS EMDEN off the Cocos Keeling Islands. This was Australia's first naval victory.

Friday November 19: Anniversary of the WW II battle between the Australian cruiser HMAS SYDNEY (II) and the German raider KORMORAN off the West Australian coast which led to the loss of both ships and the entire crew of HMAS SYDNEY (II).

Nominated frequencies (+/- QRM)

CW	3532	7020	14052	21052	21132
SSB	3620	7090	14175	21175	

The Australian Naval Amateur Radio Society is pleased to announce it has received recognition from the world's largest naval/maritime amateur radio organisation — the American based Society of Wireless Pioneers.

Membership of the ANARS is open to all amateurs and swls with a professional naval or maritime background. Details can be obtained from the Hon Secretary (VK2ALG) at 467 McKenzie Street, Lavington, NSW 2641 or by telephone on (060) 25 3292.

Terry Clark VK2ALG
Hon Secretary ANARS

Air Forces Amateur Radio Net

The Air Forces Amateur Radio Net had their new award on display at the Nambour Sunfest. The award is a 24" x 12" pennant, made of light blue polyester fabric with the Net eagle and information screen printed in dark blue, plus the red, white and blue roundel.

The award is aimed at those with an interest in air forces.

More information can be obtained on the Net of a Tuesday evening.

Bob Neville VK4ACL
Hon Secretary AFARN

Air Forces amateur Radio Net award pennant.

Radio Amateurs Old Timers Club Australia

Change of broadcast times

With the advent of Daylight Saving time our monthly series of broadcasts and call backs will be one hour earlier in November, December and February. As usual there will be no broadcast in January.

Times and frequencies for the above three months will be:

2 metres and 40 metres	2300 UTC
20 metres beaming north	0000 UTC
20 metres beaming west	0100 UTC
80 metres	0930 UTC

Members are asked to note that the November broadcast will be on November 1st, not November 2nd as printed in the September issue of "OTN". Conditions on 40 metres have been poor recently so perhaps our 80 metre transmission will become more helpful.

Allan Doble VK3AMD

Moorabbin & District Radio Club Inc

Members and visitors attending the club's general meeting on the third Friday of each month are assured of an interesting evening. Speakers at recent meetings have been Tony Burt VK3TZ, Jindalee, OTHR; David Turnbull, co-ax cables and connectors; and John Day VK3ZJF, PACTOR.

Our club station VK3APC was active and scored very well in both the Novice and Remembrance Day contests. Plans have now been made to go ahead with "Project 70". This is a money raising effort to finance equiping VK3APC with 70 cm gear. The first event in this project will take place in the club rooms on Friday evening November 5th. It will take the form of a sale of used gear, some from deceased estates and some from club members. Selling is restricted to club members only, but prospective buyers are invited from all over and will be most welcome.

Allan Doble VK3AMD
ar

CONTESTS

*P Nesbit VK3APN — Federal Contest Coordinator **

Contest Calendar Nov 93 — Jan 94

Nov 1/7	HA-QRP 80m CW Contest	(Oct 93)
Nov 13	ALARA Contest (Mixed)	(Oct 93)
Nov 13/14	WAE RTTY DX Contest	(Jul 93)
Nov 13/14	OK-DX CW Contest	(Oct 93)
Nov 13/14	ARRL International EME Competition	
Nov 27/28	CQ World-Wide CW DX Contest	(Sep 93)
Dec 3/5	ARRL 160m Contest	
Dec 11/12	ARRL 10m Contest	
Dec 26/		
Jan 16	WIA Ross Hull Memorial Contest	
Jan 1	ARRL Straight Key Night	
Jan 15/16	VHF/UHF Field Day	
Jan 15/16	HA DX CW Contest	
Jan 28/30	CQ WW 160m DX Contest	

As I write this in early October, conditions are continuing to improve. Weak stations seem to be easier to work, and there have been some good long-path openings on 40 in the afternoons, evidently extending as far west as VK6! Hopefully these good conditions will by now be spilling over into the "biggies" (CQ-WW DX, phone & CW). If things go really well there might even be some good DX openings during the 160 m DX contests in December and January. Now is the time of course, to perform all those antenna repairs and improvements you've been putting off through the winter months!

Many thanks to the following for their help, information. and inspiration: VK2SRM, VK4LW, VK5OV, ZL1AAS, ZL1GQ, CQ, QST, and Radio Communications. Please keep the letters coming, including any spare copies of results. Until next month, good contesting!

73
Peter VK3APN

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in April AR.

ARRL 160 m DX CW Contest

December 3/5, 2200z Friday — 1600z Sunday

The object in this contest is to work as many W/VE stations as possible. Categories are: Single Operator (QRP to 5W, Low Power to 150W, and High Power above 150W O/P), and Multioperator single TX. Exchange RST (/MM and /AM stations should add ITU region 1, 2 or 3). W/VE will add ARRL/CRRL Section. Note that 1830-1850 is recommended for intercontinental QSOs.

Score 5 points per QSO. The multiplier is the total number of ARRL/CRRL sections plus VE8/VY1 worked (max 77), and the final score equals QSO points x multiplier. Include a dupe sheet of 200+ QSOs. Logs on MS-DOS disk are welcome. Send logs postmarked no later than 30 days after the end of the contest to ARRL Contest Branch, 225 Main Street, Newington, Connecticut, CT 06111. Certificates will be awarded to the top scoring station in each category in each DXCC country. Note that the use of non-amateur radio means of communication during the contest (eg telephone) is not allowed for the purpose of soliciting QSOs.

ARRL 10 m Contest (CW & Phone)

December 11/12, 0000z Saturday — 2400z Sunday.

The object of this contest, which runs on the 2nd full weekend of December each year, is for amateurs worldwide to work as many stations as possible on 10 m phone, CW, or mixed. Operate 36 hours maximum; listening time counts as operating time. Categories are as for the 160 m contest (see above). Send RS(T) plus serial number; W/VE will send RS(T) plus state or province. CW entrants should stay below 28.3, avoiding beacon frequencies. Note that 28.09 — 28.13 has been set aside for slow speed code 10-13 wpm. Stations entering the mixed mode section may work stations once on CW and once on phone.

Score 2 points per phone QSO, 4 points per two-way CW QSO, and 8 points for CW QSOs with US novice or technician stations signing /N or /T (28.1 — 28.3 MHz only). Multipliers are the 50 US states plus District of Columbia, plus Canada NB NS (VE1), PEI (VE1/VY2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), YUK (VY1), NF (VO1), LAB (VO2), plus DXCC countries except US and Canada, plus ITU Regions (/MM & /AM QSOs only). Multipliers are counted separately on each mode. Final score is total QSO points x total multiplier. Include a dupe sheet for 500+ QSOs. Logs should be sent as for the 160 m Contest (see above).

Results of Merv Stinson Memorial Sprint Contest

The results of this 80 m contest, held over a 1 hour period in June, show a good turnout of VKs, ZLs, a P2, and a VE, proving that the sprint contests really work. Many thanks to Rick Chilcott VK4LW for the following information:

VK2LEE	38	1st VK2 & Novice	L40018	17	1st VK SWL
VK2CKW	27		VK5ATU	42	1st VK5
VK3NFJ	29	=1st VK3	VK5UE	26	

VK3DD	29 =1st VK3	VK7CK	30 1st VK7	VK5DUG	7
VK4YB	73 1st VK & VK4	ZL1BVK	49 1st ZL	VK6ANC*	53
VK4OH	61 2nd VK	ZL1AGO	45 2nd ZL	VK6XG	39
VK4HF	59 3rd VK	ZL1HS	31 3rd ZL	VK6BN	32
VK4YZ	52	ZL2AJB	37		
VK4EFX	47	ZL1AAS	29		
VK4BB	42	ZL2BSP	21		
VK4MCA	23	ZL4QZ	19		
VK4NAD	22	P29RB	8 1st P2		
VK4VG	22	VE7BS	12 1st DX		
VK4FRZ	18	ZL1AMU	Check Log		

Results of 1993 Australasian Sprints

Entries for the 8th Australasian Sprints were a pleasing 17 (CW) and 30 (phone), although it is disappointing that less than a quarter who were active submitted logs.

Despite propagation and noise problems experienced by some operators, the CW scores were very good, whilst in the phone section they were generally similar to last year. The earlier start seems to have been readily accepted, particularly by VK6s, and everyone appeared to have enjoyed themselves. However entrants should remember that the contest is only for QSOs between VK, ZL and P2.

The Adelaide Hills Amateur Radio Society and the VK5 Division of the WIA congratulate the overall winners, Dale Cavies VK5AFO (CW), and John McRae VK5PO who had an outstanding score in the phone section, both of who have had consistently high scores in the past. The winners in the individual call areas are also congratulated.

This year saw two novices enter the CW section, with the certificate being won by Max Bruce VK3NZO. Congratulations to both for their good results and hopefully other novices will be inspired to take part next year.

Over the years many have regularly entered the Sprints, but special mention should be made of SWL Charles Thorpe L40018 who, I believe, has participated in every one.

Results, together with points claimed or allowed, are shown below. Asterisks indicate certificate winners.

73, David VK5OV

CW					
VK2QF*	16	VK5RG	12	VK4XD	30
VK2VZB	10	VK5UE	4	VK4NAD	18
VK3XB*	18	VK6BN*	18	VK4KJO	13
VK3VB/P	16	VK8AV*	12	VK5PO**	76
VK3NZO*	15	ZL1GQ*	18	VK5ON	63
VK3QZ	12	PHONE		VK5AFO	61
VK4OD*	21	VK1JE*	35	VK5XY	53
VK4TT	16	VK1KLB	16	VK5AC	49
VK5AFO**	23	VK2FUH*	23	VK5UE	31
VK5PO	19	VK3NFJ*	44	VK5ADD	31
VK5ADD	17	VK4HF*	59	VK5ZD	20
VK5ATU	14	VK4OD	32	VK5RV	20
				VK5TY/P3	15

RESULTS OF 1992 VK-ZL-OCEANIA DX CONTEST

Finalisation of the results for the 1992 contest was delayed, due to a large batch of logs from Europe being held up in the mail. Asterisk indicates top scoring stations in each section and country. Detailed VK results were published in March AR. Many thanks to John Litten ZL1AAS, the manager of the 1992 contest, for the following information:

Top Scorer in Each Continent:

	Phone	CW	Phone SWL	CW SWL
Oceania	YC8PN	YB6TI		
N. America	K3ZO	K7JYE		
S. America	No entry	No entry		
Europe	UB7W	UB3JWW	UB5-073-1610	UA6-150-1367
Africa	AM8TH	7Q7XX		
Asia	UA0SAU	UA0SAU		

PHONE RESULTS:

Oceania:

V73SG*	2436
YC8PN*	21824
YC8NA	14756
YC0PGN	6840
YB1DYB	2440
YC1BGI	2196
YC8SSB	2176
YC2GAM	612
YC0GPH	386
YC8OD	144
VK2APK*	1554293
VK8AV	491381
VK2AYK	456148
VK2PWS	356963
VK3DZM	268800
VK4DMP	263097
VK5AFO	195480
VK6WJH	84851
VK4NEF	74965
VK5PMC	59500
VK2PS	52530
VK2ARJ	46996
VK2XT	14784
VK2CJH	13209
VK3DRX	10950
VK3ENX	2407
VK3SM	812
VK8BE	646
VK5OE	check log
ZL1BVK*	244052
ZL3TX	156052
ZL1IM	70007
ZL2AFY	40500
ZL1AAS	check log

North America:

K3ZO*	3588
VE3MX*	2

Europe:

DL2VDX	3720
DL0SK*	3700
DL8DSL	1900
DL8UCC	1680
DJ2JAA	168
DL8UTC	70
AM7BA*	1430
EA4BYJ	210
EA5CKP	80
AM2CR	30
G3SNN*	5160
G3NAS	5110
HA5BPC*	54
HB9DX*	768
IK0HTM*	198
IK0QDB	8
LA1TV*	154
LZ2KRU*	810
LZ3BS	234
OE1TKW*	48
OG6IU*	3796
OH2BVM	432
OG7NW	2
OK1AD*	1804
OZ4FF*	24
PA0QLD*	192
SM0HTO*	520
SP0LUV*	1400
SP1JXC	252
SP0DVP	196
UZ1OWZ*	4200
UZ4HXY	4030
UC1WWR*	12
UB7W*	9672
UB5EDU	7200
UB3JWW	5304
UY7E	4582
UB4HO	4544
RB5IIU	18
YU7SF*	8
9A3CR*	7440

Africa:

AM8TH*	50
5U7M*	32

Asia:

JA6BIF*	8820
JA1HVS	6944
JA9KKD	3876
JA7BEW	3820
JE2UFF	3360
JA5APU	2550
JH2JNU	2000
JA1HFY	1950
JA6EFT	1936
JA6CM	1628
JR7LVK	1596
JF2PTA	1480
7M1GAG	1472
JL1DRX	1428
JF2LEX	1296
JA5JP	1280
JH2WHS	1184
JG1TVK	1056
JF3EIU	1020
JM1NKT	850
JA1AB	782
JA0HYU	750
JA4DHN	728
JR9NVB	700
JA2IZA	690
JA2TK	672
JA0BPY	672
JA3CVJ	650
JK2VOC	560
JA0CJK	560
JH1NXU	546
JA9IKL	528
JA2GHP	494
JE3KGT	480
JA1SWL	468
JA6QDU	432
JG1BSB	396
JA1STY	384
7M2CAG	352
JK6ISK	374
JA4ETH	342
JG1RDV	336
JA1RKI	280
JA0YAK	252
JH2HFD	224
JA1BDI	192
JE8FFS	176
JP1LPH	150
JF1PHJ	144
JH3AKD	140
JG1GBL	126
JA1IT	96
JH4LPY	84
JH1RMH	72
JR3KAH	72
JG1TVC	60
JE2IFM/1	60
JA3SSB	60
JA9XAT	60
JA6CDC	56
JA7HB	42
7M1JJB	40
JG1RRU	40
JA8YEA	40
JG3UOB/1	32
7N1HFK	24
JA9YAV	24
JA1POS	20
JN1FRL	18
JR2TRC	18
JN1OVF	16
JH1PXY	8
JA6BWH	4
7K2PBB	2
JT1BV*	48
UA0SAU*	18360
RA0FA	10028
UZ9XWH	3968
UZ9CZO	3328
UZ9MXM	2300
UA9YJO	1240
UW0ST	1200
UL7OB*	4556

CW RESULTS:

Oceania:

YB6TI*	23940
YC2ENE	3424
YB2BKJ	Check log
VK2APK*	1872520
VK8AV	1168512
VI6ZH	707229
VK2KM	554554
VK9NY/2	533544
VK6HG	286396
VK2DID	195494
VK6BB	190476
VK4TT	129564
VK4XA	129213
VK2PS	85918
VK4OR	56980
VK5AGX	55176
VK4OD	23328
VK3VB	22308
VK4LV	19497
VK3XB	13529
VK2AIC	13166
VK7RY	7072
VK6IV	6600
VK3DRX	3240
VK8BE	576
VK3KS	342
ZL3GO*	2416960
ZL1AIZ	818244
ZL2AGY	731000
ZL1HV	164112
ZL1VD	160769
ZL1AIH	45600
ZL3BJ	8250

North America:

HP1AC*	330
K7JYE*	2668
K3ZO	2300
K2SX/1	1518
WA1PFC	8
VE3HX*	540

Europe:

DL6YK*	1320
DJ4SO	1160
DJ5GG	912
DL8UCC	630
DL3RD	408
Y21PE	420
Y21TO	126
DL6UEG	84
DL8UED	32
DL1DQJ	8
DL1DQY	8
DL1DQD	Check log
DL5AMF	Check log
EA5CKP*	520
AM2CR	180
AM5BZS	Check log
G3GLL*	1440
G3DYY	828
G5MY	782
G5RV	736
HA5LZ*	672
HB9DX*	728
IV3FSG	972
I0ZUT*	644
IK3JLV	448
IK5TSS	360
LA5WQ	Check log
LA7U	Check log
LA9PEA	Check log
LY2BLA*	32
OE1TKW*	286
OH2BCI*	4608
OH1TN	2236
OH2YL	640
OG7NW	50
OH3TY/OH0*	3060
OH2EJ	Check log
OH6NH	Check log
OK1AD*	2228
OK3KAG	2208
OK3CIR	1628
OK1TW	756
OK1BLC	588
OK3TUM	Check log
OZ1FTE*	1900
OZ4FF	198
PA3CNI	32
PA0PLN*	24
SM0NJO*	312
SM0DZH	252
SM5BBS	Check log
SM5BDY	Check log
SP4AVG	Check log
SP9BBH	Check log
TF3DX*	380
UZ1OWZ*	5476
UZ1AYZ	1462
UA3XDF	198
UA6BCE	50
UA4ANZ	44
UA4YG	Check log
UA9XS	Check log
UB3JWW*	8004
UY7E	4970
UB4HO	4692
UB7W	4320
RB4EK	418
RB5QI	160
UB5TN	108
UB4JLF	Check log
UC2ADM*	18
UL8GWJ*	4320
UO5OA*	260
YL2EC*	72
YU7SF*	242
YU7KM	162

Africa:

7Q7XX*	18

Asia:

HL5AP*	928
JH3LCU*	8556
JK1AJX/1	7912
7M1GAG	3640
JL2LPX	3366
JA1WYQ	3214
JJ1JGI	2320
JA1PUK	1950
JG1BSB	1900
JA1AA/QRP	1804
JA1AB	1680
JA6BIF	1680
JA0BPY	1610
JA3ARM	1518
JA2GTW	1452
JA1RKI	1288
JA9CWJ	1218
JF0SGW	1000
JA2ANR	680
JA6QDU	600
JA1XCZ/4	576
JA5APU	570
JF7QUE	570
JA6BWH	544
JK6ISK	336
JH1PXY	312
JA7ARW	286
7L2UQY	264
JA4ETH	260
JK2VOC	234
JH1NXU	200
JJ7NUC	200
JF2WXS	176
JA2DN	120
JA8AJE	98
JR1DTN	84
JA4AOR	75
JN6CYC/1	60
JE0WJS	56
JA1AAT	50
JG1RDV	50
JL2XCA	50
JE2IFM/1	32
JE2LPC	32
JF2MVI	8
JF2LTH	8
JA0HJI	8
JG1RRU	2
JF2LEX	2
UA0SAU*	11074
RA0FA	6956
UZ9CZO	3960
UZ9XWH	3392
UA0LCZ	3248
UA9OA	1850
UZ9MXM	1776
UW0ST	6
UL7OB	782
UL7BAY	384

SWL PHONE:

VK6-Peter Kenyon	42048
VK3-Jon Finn*	5000
JA1-7777*	4958
JA8-3339/1	128
I4-2865*	208
ONL-4003*	252
SP-0189-6D*	72
UA6-150-1367*	4224
UA0-098-134	2132
UB5-073-1610*	12342
UB4-060-175	1440

SWL CW:

UA6-150-1367*	828
UA0-098-134	336

PO Box 300 Caulfield South VIC 3162

ar

Divisional Notes

Forward Bias — News from the VK1 Division

Christopher Davis VK1DO

Recent broadcasts have included some timely reminders of forthcoming events, some of which fall early in the new year. The John Moyle contest has attracted some excellent early planning and I am sure this preparedness will pay dividends.

Earlier still, in the new year, and equally important, is the matter of our Division's AGM. You might feel that November is an excessive amount of advance notice for an event which takes place in February. My experience is that three months is a minimal amount of notice to adequately stimulate planning and consultation between members and the existing committee. I am confident that more people will seriously consider standing if they are not put on the spot in the weeks immediately prior to the AGM.

If you would consider a position on our committee, but are uncertain of what is involved in terms of time and responsibility, please speak directly with an existing committee member. You will be pleasantly surprised as to how reasonable the expectations are and just how readily a new committee member has settled in with no previous experience.

I hope that all members have repaired relations with their respective spouses after the vast new acquisitions that took place at our October meeting during the trash and treasure. I hope that some of the plans that were heard being espoused come to fruition. There should be numerous amateurs head down and tail up with soldering iron in hand.

You might have gathered that repeat broadcasts of our Monday night transmissions have ceased. These Wednesday night repeats were involving a considerable effort in recording the original, transporting the tape, organising volunteers for running the repeat, etc. No doubt, now that we have discontinued the service, there will be generous claims by those who thought it was of earth shattering importance and how readily they are able to step in and run it.

Unfortunately, a lot of this rhetoric misses a few fundamental points. The broadcast can be readily tape recorded by the individuals who know in advance that they are going to miss it, or might miss it. Just a Kambrook power timer and a cheap deck will do the trick. Or, alternatively, organise a friend to do it for you. Furthermore, the degree of advance notice and repeated content within the broadcast assures the listener who misses one week of some degree of overlap later.

One final reminder regarding our November 22nd Xmas party. This will take the form of a bring your own everything BBQ at Weston Park peninsula in Yarralumla. Listen for talk in directions on channel 146.500 MHz FM. Weston Park is the continuation of Banks Street in Yarralumla.

Our last examination in all subject areas will take place on the 28th of November at the Hughes Community Centre in Wisdom Street in Hughes. For further details and application forms, please telephone Jan Burrel, VK1BR on 291 7123. The close off date for this exam is Friday November the 12th

I hope you will make the effort to bring the whole family for our XMAS party and I look forward to seeing you there.

VK3 Notes

Barry Wilton VK3XV

New Service for Members

WIA Victoria is now able to offer credit card facilities to members. The office is able to accept VISA, BANKCARD and MASTERCARD for all purchases over $10.00, including telephone and mail order.

It should be noted that membership subscriptions must be paid directly to the WIA Federal Office.

1994 Classes

WIA Victoria will be conducting a Novice class in 1994 on Tuesday evenings at Camberwell Grammar School. Instruction is available in both Morse code and theory, and examinations will be conducted "in house" at the completion of the 24 week course.

The course commences in February 1994 and a brochure containing full detail is available by telephoning or writing to the WIA Victoria office. WIA membership will be available to students at a specially discounted rate for the first year's subscription.

Please recommend our course to your friends as it is one of the best available in Victoria.

1994 Membership Subscription

The 1992 Annual General Meeting authorised a $6.00 increase in the Divisional component of the subscription. This increase was not implemented in 1993 due to the Council decision to postpone same for 12 months.

Cost savings in a number of areas, coupled with improved efficiency and profits from trading will enable a further postponement of any increase.

THE 1994 SUBSCRIPTION FOR ALL GRADES OF MEMBERSHIP WILL REMAIN UNCHANGED.

QSL Bureau

The QSL Bureau is operating very efficiently. However, there has been some fall off in the number of cards being processed owing to the decline in propagation.

The QSL Bureaux are operated as a free service to members and constitutes a major expenditure item of members funds. Currently the Bureau handles outgoing cards for no charge to members, and at a cost of 10c per card for non members. The Inwards Bureau is a free service to members and non members are required to pay $3.00 per month to use the service.

As from February 1st 1994 the QSL Bureau will provide services for members only, and non members' cards will be held at the office for collection for a period of 6 months.

5/8 Wave — VK5 Notes

Rowland Bruce VK5OU

I didn't attend the September Council meeting due to a missed plane connection. As it happened (see later), perhaps I was fortunate. It must have been a pleasure, though, for members to approve eight membership applications. Welcome to:

J Bugno	VK5CJC
S Birkin	
O Szemis	VK5ADX
G Bridgland	VK5NDZ
G Bruecher	
P Maumill	
D Bramich	VK8XDB
R O'Brian	VK5ZOB

By now JOTA and "Leisure Day in the Park" will have been and gone. From the plans being made I feel confident that all will have gone well. Another opportunity presents itself shortly for us amateurs to get out and about. Camp Quality is not that far away. Please make arrangements with John McKellar VK5BJM, if you can lend a hand.

The Council agreed that the Divisional component of membership fees remain the same for the forthcoming year. I'm sure this will be greeted with relief. Also welcome, perhaps, is the decision to have a clubs convention once again. It is planned for 25th to 27th February at Douglas Scrub, the Guide campsite.

I was one of the examiners recently at the BGB. It looks as though there will be some new callsigns around soon. Those who were not successful, by and large, came within a cat's whisker (remember those things?) of passing. I hope they do not feel discouraged and will sit the next set of questions.

Christmas is fast approaching! So is the annual social evening. I'm not sure of the exact date, but believe it is likely to be earlier than usual. Keep an ear out for the date, and try to be there. If it follows the pattern of previous years we can expect a good evening's entertainment and fellowship.

Fellowship was certainly not in the air at the September Council meeting. About midnight the members were startled by a loud crash and looking out the window they could see evidence of a road accident outside in West Thebarton Road, but by the time they arrived on the scene the driver of an allegedly stolen car had disappeared on foot down the road. This vehicle had rammed Secretary Maurie's car, causing it to cannon into President Bob's and writing it off. The things some people suffer for amateur radio.

Talking of Maurie, have you seen the Journal lately? A great effort. Where does the time come from? Perhaps members and non-members, if they have an item to contribute to this column, or to the Journal, could submit it to Box 1234, GPO Adelaide 5000. Both of us would welcome extra material.

QRM from VK7

Frank Moore VK7ZMF

Council meeting 11th September 1993

A very productive meeting was held in Launceston with all divisional council members attending except our treasurer who is away working on the mainland. It was also pleasing to see a large contingent of visitors.

Special Event Station

A special event station is to be run to celebrate the commission of the Tasmanian Government's new ship the "PETER PAN" which is to replace the "ABEL TASMAN". The ABEL TASMAN is our main ferry and link across the Bass Strait and has served us well over the last eight years but the new ship will be much larger and quicker. Details of the special event station are not available at this stage as this is a new idea but it is proposed to run a station from the ship on its first crossing and then carry on from various locations around Tasmania. QSL cards and awards will be available. Details to be published and will follow as soon as they come to hand.

Central Highlands Hamfest

A hamfest is to be held at the Great Lake, Central Highlands. This event is now looking as if it will go ahead as the expressions of interest are starting to arrive. The proposed time is March 1994.

A few details. The venue is at Miena on the Great lake which is in the centre of the famous highland trout fishing area. It is also the centre of Tasmania making it very accessible from anywhere on the island.

There is plenty of accommodation at reasonable rates right at the venue. Trade tables from Yaesu, Icom, Kenwood, George Harvey, etc.

Also workshops from various amateurs and other organisations. Should be a great event so let us know if you would like to come. Contact Peter Clark VK7PC in the north or Bill Reid VK7JWR in the south for more details.

ar

Education Notes

*Brenda Edmonds VK3KT **

There has been discussion recently about the lack of resources for students, instructors, and newly licensed operators.

One statistic which has never been recorded is the proportion of examination candidates who have attended some sort of training course, or have prior qualifications in electronics-related fields, as against those who try to achieve their licences by self study. This would, of course, be hard to assess as many of the "self taught" do indeed have assistance from friends and colleagues. In any case, though, it is pretty hard work trying to gain a licence without a formal support system to guide, direct and answer questions.

The resources available are mostly those from sister societies such as the ARRL and the RSGB, rather than local productions. I know of only about five texts or manuals produced in Australia over the last ten years, and not one of those can be recommended as "all you will need" to a beginner. Admittedly, the principles of transmitters and antennas do not vary and I would never recommend that a beginner rely on only one text, but there are times when an Australian publication would be of more use than an overseas one.

So what do we need, and who should do something about it? Should there be a Teacher's Guide as well as a student text? Which should have the higher priority? Is there a need for a "Guide to the Newly Licensed Operator"? In the past, the new licensee generally began operating under the watchful eye of the older amateur who had inspired and coached him (nearly always him), but that tradition seems to be dying.

I have been asked many times for a correspondence course for the Novice licence, and have passed on that request, but so far I have not heard of one that is working. I have also been asked for a course on audio tape for the sight-impaired or for students such as drivers who could listen while driving. I would like to see a complete course available on videotape on a non-profit basis, and an "Ask the Expert" service to which the remote students could send their problems for discussion.

Any readers who have views on the provision of such resources are welcome to contact me. Your comments on needs and priorities will be welcome. If you have materials to share with the wider community, I will be pleased to review or publicise them.

In the meantime I am keeping busy with the review and extension of the Theory Examination question banks. It is hoped to have this completed about the end of the year. If the banks are then published, they should become a significant resource for both teachers and candidates. I also have a partly completed Study Guide for the AOCP level. If any readers wish to have input into that, I would be pleased to send a copy for comments. There is still a lot to be done but time and energy are both scarce. The physical resources which the WIA can provide are limited, but some of its major resources are the knowledge, skill and enthusiasm of its members.

**WIA Federal Education Co-ordinator*
PO Box 445, Blackburn, 3130

ar

Don't buy stolen equipment — check the serial number against the WIA stolen equipment register first

How's DX

*Stephen Pall VK2PS**

To compile this column, I use three sources of news. I am spending at least a couple of hours almost every day on the bands, listening mostly and transmitting occasionally. I receive three DX Bulletins each week. One of these bulletins is funded by a well known DX-er, located between Sydney and Perth, for which generous gesture I am thankful. The third source of my news is the readers of this column who supply me with band reports, interesting QSO news, QSL information and occasionally with some DX news. The difficult task is to decide what is newsworthy by the time you read this column. The leadup time and deadline with our monthly magazine on the average is four to five weeks. (I am writing this on the 30th of September to appear in the November issue). My aim is to give you the most up-to-date information of future DX activity which is still current and on the bands when you eventually read the column. I think, it would damage the credibility of this column if, as an example, I had told you in the October issue to look out for Baldur, active in Nepal as 9N1BD, when that activity ceased on the 7th of September.

However, if you feel that I should report on past DX activities (provided the Editors are able to find me more space) I will be glad to do so. Send me a short note to guide me about your feelings and requirements. I must also note that lately I am receiving less and less reports from my regular contributors. Don't tell me, you gave up DX-ing because propagation is not the best? I need your support! I need your report which should reach me around the 20th of each month. You, the reader deserve an up-to-date newsworthy column and with your assistance I will be able to continue to produce one.

Mellish Reef VK9MM

At the time of writing this the Mellish Reef DXpedition is on the high seas, returning to Queensland. Having worked them in different modes on a variety of bands, and having heard the favourable comments from both VK and overseas stations, the activity on Mellish was a huge success.

Mellish was at the 26th place in the list of "most wanted countries" before this activity. The members of the expedition can be proud of their achievements because they reduced substantially the demand for this very rare DX country.

I heard Bill VK4CRR first as maritime mobile on the 17th of September when they were still 147 nautical miles away from the reef, under motor, against headwinds, with a speed of 8 knots.

Next day, they were pounding away on 7 MHz with a high speed CW transmission. The 18th September on 7 MHz at around 1400 UTC was the DXers' CW paradise. Not only Mellish was active, but at the same time there was VS6WV, HZ1AB, T30NA, BV7FC and others, all right next to each other. Within a few days the Mellish group gradually extended their activity to ten bands on CW, SSB, RTTY and the occasional 6 metre contact. There is no doubt they were well equipped. Five Yaesu HF stations, amplifiers, a variety of Yagi, vertical and wire antennas did the trick. Propagation was generally good from VK, however, some difficulty was experienced on 21 and 28 MHz. The "chit-chat" SSB group on 160 metres was quite surprised one day when they found themselves on the same frequency with VK9MM which had a good, strong signal in the eastern VK states.

On the 22nd of September they had 20,000 QSOs in the bag but the number was increased two days later to 33,000. They finished up eventually with about 44,565 contacts.

On the 25th of September the weather, which was perfect until then, had changed. The seas were high, the 63 foot (19 metre) yacht "Nina Q1" had to move half a mile offshore out into the sea to avoid being swept on to the reef. Rain started to fall, driven by the wind. This was not pleasant on a speck of sand which is about 300 by 60 metres and on average is only about 2 metres above sea level.

The VK novices had the opportunity to contact Mellish on Sunday evening the 26th of September (local time) on 3600 kHz. Later VK9MM moved on into the "DX window" of the 80 metre band.

In the meantime the rain and the wind continued lashing the reef. It was time to pack up and go. The expedition left the reef two days earlier than planned originally. After four days of sea travel, which upset many a stomach of the expeditioners, they landed on the 30th of September at the Kingfisher resort of Fraser Island where they stayed overnight. On the first of October they landed on the Queensland mainland about 100 km north-east of Gympie at Tin Can Bay.

My commiseration to those DXers who needed Mellish but were unable to work it. Now you have to wait at least five to seven years before another group will tackle that particular sandbar in the Coral Sea, some 600 miles due east from Townsville, with the coordinates of 17°24'39" S and 155°53'25" E, and also known among island chasers as IOTA OC-072. QSLing will start on the 1st of December and the QSL manager is VK4CRR Bill Horner, 26 Iron St, Gympie, Queensland, 4570, Australia. Do not forget to include a SASE (VK) or reply envelope with IRC or one "green" stamp (overseas).

Pratas Island BV9

By the time you read this, the proposed Dxpedition to this island (see August and October issues of *Amateur Radio* magazine) has probably taken place, as it was scheduled to start on the 6th of October. Pratas has been mentioned as a possible DX country before. It lies at least 234 statute miles in distance from Taiwan which country claims sovereignty over the island. Intended operation time of the expedition is about 10 days. The latest information, dated the 20th of September, gave the callsigns of the prospective operators for the station BV0ARL/BV9 as BV5AF, BV5AG, BV40B, BV5CR, BV2FB, BV2VA, BV4BL, BV4CL, BV4TC, and BV2WC, plus K7JA, N4VA, OH2BH (Martii), and OH6DO. The operators" credentials were all checked by the Taiwan Defence Department. Operation is to be on 6, 10, 15, 20, and 40 metres.

Peter I Island DXpedition

Planning of this expedition is progressing according to plan (see June and October issues of *Amateur Radio*). The group will sail from Port Stanley (Falklands) on the 23rd of January 1994 aboard a Russian 18,000 ton ice-breaker now fitted to carry 100 passengers and two, seven passenger helicopters. The ship on its voyage to Peter I Island will sail south into the Drake passage towards the Antarctic Peninsula, where various landings will take place for the benefit of the other passengers. The ship will reach Peter I Island on approximately the 1st of February. The expedition will land by helicopter. The necessary equipment is being assembled now, from tripods, which will hold the 40 foot telescopic masts, to a great number of antennas, among them the GAP vertical antenna which proved itself on Mellish Reef. They have two 4 kW Generators but need more power and they plan to have 800 gallons of fuel available. The budget of the expedition is $US200,000, and they plan for 70,000 to 90,000 QSOs in 16 to 17 days. Contributions are urgently needed. Please send your donations to AA6BB, Jerry Branson, 93787 Dorsey Lane, Junction City, OR 97448, USA.

From Wales to Wahroonga — VK2WAH

This was a special event station commemorating the 75th anniversary of the first direct wireless message from the United Kingdom to Australia. The wireless message from Wales was sent by Marconi, for the then Australian Prime Minister Billy Hughes who was visiting his birthplace in Wales at that time. The event took place on the 22nd of September 1918 and the signals were received at Wahroonga, a suburb of Sydney 20 km north from the city centre, by Ernest Fisk in a receiving station attached to his private home. Fisk was the Managing Director of Amalgamated Wireless (Australasia) Limited, known today as AWA Ltd. AWA was the pioneer of commercial manufacturing of radios and communication equipment and has been manufacturing ever since that time.

In September 1993 amateur radio operators from Wahroonga and nearby areas formed a new group, the Wahroonga Amateur Historical Radio Association (WAHRA) which operated the special event station VK2WAH. On the 22nd of September a special ceremony was held at the Monument, commemorating the sending of the first message, which was attended by hundreds of school children, local dignitaries, historians, the press, a great number of radio amateurs, eleven surviving members of the Fisk family, and the son of Charles Maclurcan (former VK2CM), an amateur pioneer between the two world wars.

VK2WAH was in operation for only 24 hours. Eight operators were active on nine bands with a total of 134 contacts in CW, SSB and FM modes. Poor propagation limited the number of contacts but, despite this, 16 countries and 40 prefixes were worked. The event was celebrated also in Wales, UK. The Dragon Amateur Radio Club of North Wales was activating the special event station GB2VK on the same day from the site at old Caernarfon (Carnarvon, now known as Waunfawr) the site of the old Marconi station. The re-enactment of the original contact was made on the 22nd of September 1993 on 14051 kHz at 0728 UTC, naturally in the cw mode. The ceremony at the Wales site was attended by the BBC, the local MP and other dignitaries. The Wahroonga monument was erected in 1935 and is located at the corner of Stuart and Cleveland Street. If you are around that part of the world, have a look at it. The Wahroonga Amateur Historical Radio Association plans to activate VK2WAH each year on the 22nd of September. An attractive commemorative QSL card will be sent in reply to QSLs received. Send your card with SASE to WAHRA, PO Box 600, Wahroonga, NSW, 2076, Australia. The Dragon Amateur Radio Club can be contacted at 23, Lon Hedydd, Llanfairpwll, Gwynedd, North Wales, LL61 5JY, Wales, UK.

Brunei — V85BJ

It is not often that one can have a long chat with a DX station in a pile-up in a much sought after DX land. It was therefore a pleasant surprise when Barbara called me, not on the air but on the landline in Sydney, for some information. The call, which probably was intended for a few minutes, ended half an hour later. The O'Connors, Barbara V85BJ and Brian V85EB, were on their annual holiday in their home town. Here is a micro-picture of their lives in Brunei. Brian is an electronic engineer employed by an oil company. They live about 100 km south-east from the Capital of Brunei, Bandar Seri Begawan. Brian has been there for three years and Barbara, with their two young girls, joined later. The children attend a local company school which is based on the English school system. Barbara used the WIA correspondence course to prepare herself for the exam which she passed in all three sections in one night. Her home call is VK2GTX and her reciprocal Brunei licence is 10 months old. Whilst Barbara is quite happy to be on the SSB section of the band, Brian is busy with the digital (packet) mode of communications. Barbara so far has made about 4000 QSOs which number will certainly grow by the time they leave Brunei in the middle of 1994. The equipment is a TS440S and a 3 element tri-band antenna at a height of 10 metres. The antenna is "inspected" from time to time by the local monkeys living in the area, which causes some SWR. Brunei is two hours behind Sydney time and the temperature is usually between 30 and 38 degrees. QSLs with SASE to B.O'Connor, PO Box 62, Northbridge, NSW 2063, Australia.

Future DX Activity

- Rumour has it that 9U5D will be on the bands from Burundi, activated by Belgian operators.
- Sanyi XU7VK will stay in Cambodia until July 1995. QSL to HA0HW
- Mayotte resident, Elio FH5CB, can be heard from time to time on 14195 around 0530 UTC. QSL to callbook address.
- XU1AG is active and has a new QSL manager, N7QCN.
- Bob W5KNE, editor of "QRZ DX", will be on Christmas Island (Indian Ocean) from Nov 27th to December 15th with the callsign VK9XN.
- Listen out for 3V8W. He is Karl DK2WV who plans to operate from Tunisia around Christmas time.
- There is a new operator in Equatorial Africa. Don arrived around the end of September and is expected to sign also as 3C1TR, the callsign used by his predecessor. QSL to K8JP.
- Rob is in Somalia signing T5/N3HQW and is operating on 14, 18 and 21 MHz in his local afternoon and evening time. QSL to WD4NGB.
- Keep a look-out for Jari OH3MIG/4U who will be active from the Golan Heights until December. He prefers CW. QSL to OH?GZ.

Barbara V85BJ

- If you need Wallis Island try to find Jose FW1DJ on 14115 kHz around 0430 UTC.
- ZD8M on Ascension Island is active on all bands/modes until March 1994. QSL to G3UOF.
- It was reported that Detlef OE3DKS will be active as XT2DK until April 1954. QSL to Dr Detlef Kroker, PO Box 2937, Bobo-Dioulasso M, Burkina Faso, Africa.

Interesting QSOs and QSL Information

- A41KJ — Siddiq — 14226 — SSB — 1217 — Sept. QSL to N5FTR William M Loeschman, 717 Milton, Angleton, TX 77515, USA.
- 7Z2AB — Dave — 14247 — SSB — 0525 — Sept. QSL to AA0BC Dana M.Howard, Rt 1, Box 614 Holt, MO 64048 USA.
- ZK3DM — Marcel — 14247 — SSB — 0350 — Sept. QSL to ON4QM Marcel Dehonin, Everestraat 130, B 1940, Sint Stevens Woluwe, BT, Belgium.
- AH6DR/KH7 — Gus — 14247 — SSB — 0642 — Sept. QSL to KH6JEB Richard I Senones, 95-161, Kauo Pae Place, Mililani Town, HI 96789 USA.
- 7Q7RM — Ron — 14226 — SSB — 1147 — Sept. QSL to G0IAS A R Hickman, Conifers, High St, Eckelsley, Retford, Nottingham, Notts, DN22 8AJ.
- C21/KC6DX — Yugi — 14247 — SSB — 0456 — Sept. QSL to JA2NVY Makoto Inagati, 5521, Hirakuchi, Hamakita 434 Japan.
- AH6ML/NH9 — Kirk — 3795 — SSB — 1152 — Sept. QSL to Oklahoma DX Association — Box 88 — Wellston, OK 74881 USA.
- 6K93XPO — 21020 — CW — 0620 — Sept. QSL to the Korean QSL Bureau.
- A71BH — Mohammed — 14251 — SSB — 0513 — Sept. QSL to OE6EEG, Dr Selim El-Rifai, PO, Box 31, A-8011, Graz, Austria.
- 5WIGC — Cliff — 10106 — CW — 0713 — Sept. QSL to Box 1117, Apia, Western Samoa, Central Pacific.

From Here There and Everywhere

- The planned activity of Bing VK2BCH on Lord Howe Island, beginning 18th Sept, has been cancelled. Bing phoned me after last month's closing time and advised that his health did not improve, so unfortunately he was not able to go to Lord Howe Island.
- Jim VK1FF, ex-WB2FFY says that after four months in VK he is yet to receive a VK2 QSL card. I sent my reply card direct to him. C'mon fellows, who owes him a card?
- Last month I mentioned the "160 metre Band" propagation experiment between the West Coast of the North American continent and the east coast of Australia. Roger VK4YB, one of the participants, sent me a short note about the "Seance" net (South East Australia to North America Communications Exchange) which operated from 14th of May to 13th of August. There were 646 VK/ZL check-ins and 250 DX check-ins, mostly W, VE, P29, FK8, V85, KH2, KL7 and UA0 stations. Next year activity will be from the 13th May to 12th August.
- The Council of Europe Radio Amateur Club DXpedition to San Marino T71, has produced a handsome card with a detailed map of Europe as the main feature. The Republic of San Marino has been a member of the Council since 1988.
- If you worked EX0A/EP, EX0M/EP, or 9D8UM, then send your QSL to DF8WS.
- Just heard a Sydney amateur closing his CW QSO saying to his German QSO partner "73 Fm Sydney the Olympic city". Nice touch.
- It appears that the recent operation of Karl DK2WV in Tunisia as 3V8W was a genuine one. Carl says he had a valid licence and documentation was sent to the DXCC. He made 6500 contacts on CW.
- The DX Advisory Committee (DXAC) of the ARRL recommended the reinstatement of Eritrea to the DXCC Countries list as from 24th May 1991.
- If you worked Roger in October on the CW bands from Tristan da Cunha with the callsign ZD9SXW, send your QSL card to G3SXW Roger Western, 7 Field Close, Chessington, Surrey KT9 2QD, England, or via the Bureau.
- VR2BH is the new callsign of Martii OH2BH. Martii is on a two year business assignment in Hong Kong.
- Atsu VK2BEX of Nauru, Willis and Mellish fame will attend the Swedish DX Convention at Karlsborg, Sweden between the 9th and 10th of October as a guest speaker.
- Monk Apollo from Mt Athos SV2ASP/A is reported to be involved in a list operation with OE6EEG on the weekends at around 1200 UTC. It was also reported that Apollo might ask for the call SY0A in 1994.
- The 1993 Seanet Convention will be held in Dhaka, Bangladesh from November 19 to 21.
- The "New York Times" and the "Dallas Morning News" reported in August that South Africa has agreed to turn over the enclave of Walvis Bay and some islands (Penguins?) to Namibia as soon as possible. The tentative date of the handover is 28th February 1994. If the news is correct, it could mean the deletion of these countries from the DXCC list.
- Visitors to Slovakia, OM, will receive OM callsign with the number "9".
- If you have worked Jim 5V7JB, the QSL address is Jim Brillhart, PB 8, Anie, Togo, Africa. Jim is a medical missionary in the African bush.
- If you are interested in island activity you can buy your 1993 IOTA directory from the RSGB IOTA Director, Roger Ballister G3KMA, La Quinta, Mimbridge, Chobham, Woking, Surrey, GU24 8AR, England. Price $US12 or 18 IRCs.
- A complete new multiple beam array antenna system has been installed on Aaland Islands, the headquarters of the well known OH0W location, to provide a multidirectional coverage on all bands. OH0DX was active from this site in the recent September Scandinavian activity contest.
- Talking about contests the CQWW SSB Contest will be held on October 30-31 and the CQWW CW Contest will take place on November 27 & 28.
- If you need Ethiopia you have to stay up late (1500 UTC) and try your luck on the 14243 net. Pierre, ET3RP (F6GZA) joins the net from time to time.
- It might interest you to know that Australia Post closed its internal telegram service on 1st October 1993. The development of new technology, the spread of telephone services and fax machines has made the once flourishing telegram business redundant. In 1950 more than 25 million telegrams were sent each year in Australia. This current year the number of telegrams sent was less than 60,000.

QSLs Received

S52AA (4M OP), T71CE (4M MGR F6FQK), VY1FF (2M OP), VY1JA (2M OP), E35X (2M MGR LA6ZH), D2SA (2W MGR F6FNU).

Thank You

Thanks to all of you who kept me informed and assisted me in compiling these notes, especially to VK1FF, VK2BCH, VK2DSL, VK2KFU, VK4UA, VK4YB, VK5XE, VK6NE, F6FQK, V85BJ and the following publications: QRZ DX, The Dx Bulletin and the DX News Sheet.

Good DX and 73

PO Box 93 Dural NSW 2158

ar

1994
WIA AUSTRALIAN RADIO AMATEUR CALL BOOK

on sale in November at your Divisional Bookshop

Over 18500 Up-to-date Callsign Listings
Over 500 Shortwave Listener Listings
Australian Repeater Directory
Australian Beacon Listings
Comprehensive Australian Band Plans
Complete DXCC Countries List

And much more, such as Australian TV Frequencies, QSL Bureaux, Slow Morse Transmissions, Accredited Examiners List, Repeater Guidelines, WIA Awards, Australian VHF/UHF Records, New Zealand Repeaters and Beacons, International Callsign Series, and so on.

As an active amateur radio operator can you afford NOT to have this best yet Australian Call Book?

DO NOT MISS OUT.

Limited Stock

Buy your copy NOW from your Divisional Bookshop

Cover Price $12.50

Special Price to WIA Members $11.00

All Prices plus Postage and Handling where applicable

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (the Spectrum Management Agency in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Below is a recently logged list of intruders into the amateur bands:-

September Summary 1993

FREQ	UTC	DATE	MODE	COMMENTS	X
3542	2100	230893	J3E	JA fisherfolk	4
3570	1030	0909	J3E	As above	
3620	1220	1008	A3J	B/C stn Jakarta, M.Indo	
7000	H24	0209	J3E/U	Indonesian n/amateur	53
7001	1320	0209	J3E/U	2 way n/amateur Indon	
7002	1136	050993	A1A	V Beacon	8
7005	1128	0109	J3E/U	2 way tfc n/amateur Indo	31
7010	1109	0809	J3E/U	non amateur	
7012.5	1148	1609	A3E	Wx fax 120 rpm	
7014	1140	3108	R7B	2.5 kHz wide	8
7015	1008	090993	R7B	Has timing pulse	10
7015	1128	0809	J3E/U	N/amateur Indon	6
7020	1158>	0409	NON	Runs for hours, no ID	9
7020	1015	0909	F1A	Odd grps ltrs/figs CIS	
7039.5	1110	2408	A1A	F Beacon	26
7053.5	1120	290893	R7B	2.3 kHz w/also on 7056	10
7060	1058	1409	—	"Whistler"	
7070.5	1204	0409	A3C	Wx fax 120 rpm no ID	
10115	2135	dly	A3C	as above	30
10125	0545	2608	J3E/U	F voice, id "C102"	
10147/50	0710	150993	J3E/U	Asian CB ???	
14061+/−	H24	DAILY	F7B/A1A	Data bursts China	31
14095.5	0730	1509	A1A	Calling NQF de LPC K	
14170.5	MNY	daily	F1B	Moscow Naval, 250 Hz CIS	7
14210	1100	2808	A3E	2 F/7105, B/c stn China?	17
14217.5	0745	0809	F1B/A1A	UMS chain 250 Hz CIS	
14279.5	0830	150993	A1A	PKJ	
14285+/−	0200>	Daily	A1A	VRQ msgs + tfc VTN	30
14338	0040	daily	A3C	Wx fax 120 rpm	30
18090	0635	1209	A3E	B/c stn mid east, music	
18115	0216	1209	A3E	B/c mid east Arabic??	
18135	1102	0409	A3E	B/c non, sum modulation	
18138	0154	110993	F2B	Piccolo/hrd 18127/30	
21031.5	mny	14/2909	F1B/A1A	Calls UU UMS CIS	37
21114	0550	MNY	A1A	ID P7A	12
21283/5	0500	mny	F1B/NON	No idents	18
21305	1008	0909	A3E	B/c id "All India radio"	
21314	0535	mny	A2A/NON	Ruf cw sp variations	

Stn VVH operates this freq, among many others, 21118 to 21371, same mode
Further checks needed.

24896 0031 050993 A1A 2 F/12448, Marine tfc
24953]
24963] All Military B/cast stns possibly from ASIA.
24970]

My thanks to VK's 2GS; 4BG; 4AGL; 4AKX; 4BTW; 4BXC; 4DDJ; 6JQ; 6RO; 6XW & 6BWI.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

ar

QSLs from the WIA Collection

Ken Matchett VK3TL Honorary Curator WIA QSL Collection*

Ken Matchett VK3TL in his shack.

Corsica — A struggle for Freedom

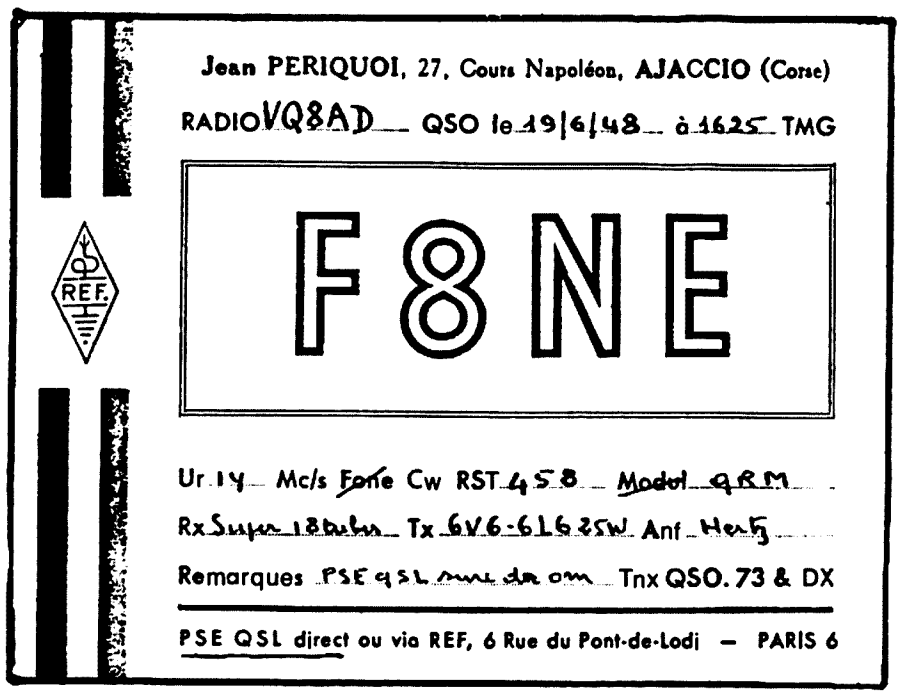
Corsica is the fourth largest island in the Mediterranean after Sicily, Sardinia and Cyprus, but it is still rather small, being 184 km long and 83 km wide — about an eighth of the area of Tasmania. Approximately three quarters of this island of bare peaks, cliffs and sandy beaches is covered by forests or by the famous *maquis*, a sweet smelling flowering shrub. The word itself is interesting. Corsicans being a proud people frequently were engaged in freedom fighting: Instead of saying that these men were outlaws it was said that they "had gone off into the maquis", which name had become used to include undergrowth in general. When World War 2 broke out the term "maquis" was used as a synonym for members of the underground French Resistance.

Due to its position in the Mediterranean, the island has been subject to numerous invasions including those of the Greeks, Romans, Vandals, Italians, Spaniards and finally the French. The Corsicans were even warred against by the Saracens, the Arab followers of Mohammed, until the Pope in 1077 handed the island over to the Bishop of Pisa. It is interesting to note that the English played a part in Corsican history. The Corsican parliament at the end of the eighteenth century (just a few years after Capt Cook's discovery of the east coast of Australia) requested help from the British in the island's struggle against the French. It was during this struggle that a young Capt Horatio Nelson, later to become Lord Nelson, the greatest of British admirals, lost his eye by fire from a Corsican gun. In 1794 the island became part of the British Empire but the situation lasted for only two years. Britain renounced her claim to the island under pressure from both the Corsicans and the French.

F8NE

When call-sign prefixes, as we now know them, were first assigned at the close of the 1920s, the prefix F was allocated to France and its colonies. During the early years of the 1930s certain of France's colonies were assigned special prefixes, the first of these Indochina (Fi), soon to be followed by Tunis and Algeria. It was not until 1937 that the magazine "Radio" listed Corsica as a separate "country" to France. However, no prefix was suggested. Between that year and the start of the war numerous French possessions were allocated identifying prefixes but there was none given to Corsica. The "Post-war Countries List", the official list for ARRL DX contest and the Post-war DXCC, published in QST in February 1947, again listed Corsica without prefix.

Immediately after World War 2 the forces of occupation were issued with the so-called XA calls. Forces on Corsica were given the station call XAAX according to the list of calls appearing in the RSGB Bulletin of December 1945. Early post-war Corsican QSLs like the one shown, F8NE, simply showed the F prefix. This particular card is dated June 1948, the QTH being Ajaccio, the capital city and the birthplace of Napoleon. It was sent to well known DXer Paul Caboche 3B8AD (then VQ8AD) on Mauritius. During the period when FC was being listed as an unofficial prefix (as early as March 1949) Corsican stations used the F prefix followed by "dash FC" eg F9VN/FC (this station in 1972 changed its call to FC9VN).



Jean PERIQUOI, 27, Cours Napoléon, AJACCIO (Corse)

RADIO VQ8AD QSO le 19/6/48 à 1625 TMG

F8NE

Ur 14 Mc/s Fone Cw RST 458 Modul QRM

Rx Super 18 tubes Tx 6V6-6L6 25W Ant Herz

Remarques PSE QSL merci de om Tnx QSO. 73 & DX

PSE QSL direct ou via REF, 6 Rue du Pont-de-Lodi — PARIS 6

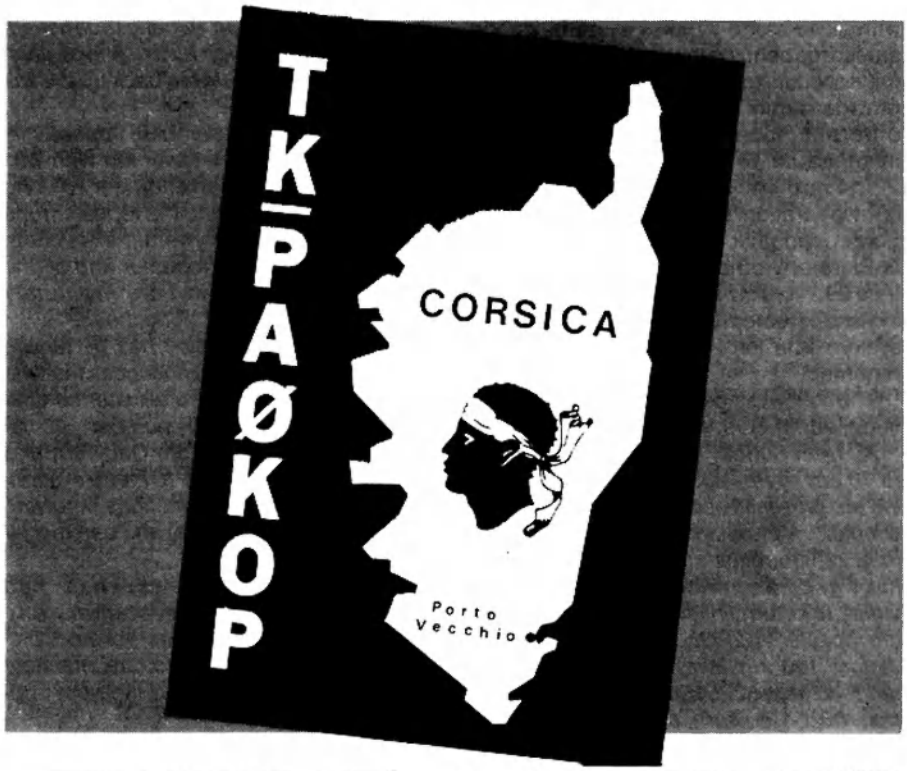
FØWV

The zero numerical prefix has frequently been allocated to portable stations, eg FC0FHK, a DXpedition by German operators in 1979, and FC0GAG in 1982 by Italian hams. Similarly, it seems that the F zero prefix was allocated for earlier portable operations. The QSL shown, FØWV, dated June 1971 was given to the Belgian Air Force amateur radio club as members of a DXpedition to the island. Of late the TK zero prefix is again of special significance, being the prefix allocated to radio clubs on the island.

TK/PAØKOP

By 1985 the prefix TK (from the new ITU allocation TKA-TKZ for France) had replaced the FC prefix. Holders of FC calls changed to TK with little or no change to the suffixes of their calls. For example, station FC9VN took the call TK5VN and FC6IDG changed to TK4ID. It is to be noted that France itself had previously used the TK prefix, albeit for special occasions. For example, TK9ITU was one of a series of TK calls issued for the World Telecommunication Year of 1979. The QSL shown, TK/PAØKOP, was from a Dutch amateur operating portable from the island and is dated May 1989. The card shows an outline of the Island and the position of the QTH, Porto Vecchio. Readers may wonder at the significance of the head band and the dark skinned face. It represents a Moor's head and was a symbol of slavery since most of the slaves of the time were Moors. The Corsicans who had fought the Saracens later adopted it for themselves to represent their own struggle for freedom.

During World War 2 Corsica came under both German and Italian occupation, Corsicans giving their support to the French Resistance under General de Gaulle. The conquest of Corsica by the Allied forces was a strategic blow against the German position in Italy. Although not independent from France, that country has granted Corsica special rights and privileges. Since the beginning of the century many Corsicans have emigrated to France due to economic hardship, several returning to the country of their birth in old age. Some attempt has been made to provide work for the inhabitants and tourism is becoming increasingly developed. There are frequent air services from France with connection flights from Britain. Also offered are ferry services from Marseilles, Toulon and Nice to the island.



Author's Note

Would you, as a reader of this series of articles on the story behind QSLs, like to add to the WIA QSL collection? Although special event and commemorative prefixes are most in demand we welcome any QSL as a donation. We also wish to build up our collection of VK and DXCC QSLs as well as IOTA and USACA numbers. Please contact the author about parcel post and letter costs. Help from DX enthusiasts would particularly be appreciated. Radio club secretaries should note that displays of QSL cards are available on request.

Thanks

The WIA would like to thank the following for their kind contribution.

Supplementary List:-

Jerry VK7DQ	Max VK3NZO
Stan VK3SE	Mike VK6HD
Tom VK5TL	Austin VK5WO
Mike VK7ME	Tom VK3AGH
Chris VK4ABM	Don VK4DC (as VK9NC & YJ8NGR)
Mick VK4AMB	Robin VK6LK

Jim VK9NS (Norfolk Island)

Also the family and friends of the following "Silent Keys". Supplementary List:-

Basil Rogers VK3ABJ (courtesy of Ted VK3ZKP)
Alan Fietz VK2QE (courtesy of Alan VK2ACN)
Mervyn Busch VK3LL
Bert Faull VK3EF

*4 Sunrise Hill Rd Montrose Vic 3765
Tel 03 728 5350

ar

Repeater Link

*Will McGhie VK6UU **

Recent communication with Rob VK2MT, resulted in discussing a simplex gateway on 10 metres to a 70 cm repeater. The idea is not new but somewhat so in Australia. The Melbourne 10 metre repeater VK3RHF has a connection to a UHF 70 cm repeater which is similar but not quite the same. Rather than have a 10 metre repeater with all its technical difficulties, the 10 metre side of things is a transceiver that receives on the same frequency it transmits on, but not at the same time. Put simply, the way your HF rig on 10 metres FM operates. Connecting it to a 70 cm repeater allows UHF operators access to 10 metres FM, with its interesting propagation.

When 10 metres FM is at its best it is quite stunning. The signals are of true FM quality. No noise just clean, quiet audio. Stations from many thousands of kilometres away are noise free in the shack with you. Connecting a UHF or VHF repeater to such an FM transceiver lets other amateurs who do not have 10 metre FM participate.

My suggestion to Rob was two 10 metre FM stations, one in VK6 and the other in VK2, operating identical systems with gain antennas pointing at each other. The 10 metre transceivers become the link between two UHF repeaters. A coast to coast link with the outputs on UHF.

If all capital cities had such a system with all 10 metre simplex systems on the same frequency, what interesting results might occur. Your local UHF output could provide a mix of varying stations from different locations as propagation changed on 10 metres.

The next step now that the VK2 system is in operation is to install one in VK6. Some feedback on the idea would help. Is there any other interest in placing on air a 29.290 MHz simplex to UHF repeater system? Remember a 10 metre simplex system is a lot easier than a 10 metre repeater.

The following general information was supplied by Rob VK2MT.

As from Sunday (12/9/93) our 10 metre to 70 cm "gateway" has been on the air. We are presently operating on 29.290 MHz simplex, connected to the VK2RUW (438.225) repeater at Knights Hill (situated halfway between Wollongong and Nowra) which is in turn linked to the Goulburn 70 cm repeater VK2RGN (438.325) at Mt Gray, almost 100 km away, To clarify, signals received from 8225 (Knights Hill) or the link from 8325 Goulburn, are retransmitted on 29.290 MHz. Signals received from 29.290 MHz are retransmitted on 8225 and 8325.

It is important to understand the 10 metre system is simplex. This will no doubt cause some confusion to 10 metre repeater operators. Users should think of the system as a "gateway" to a UHF repeater. Being simplex, there are no duplexer repeater problems, or desense to the 10 metre system.

When 10 metres FM is at its best it is quite stunning. The signals are of true FM quality. No noise just clean, quiet audio.

Work is well under way to continue this link to VK1RGI (438.525) at Mt Ginini, servicing VK1 and much of the South East part of VK2 and into VK3. Mobile on UHF, one could drive from Sydney, south through Wollongong, Goulburn, Canberra and beyond while maintaining almost constant, uninterrupted contact for over 8 hours of travelling time. In the near future, the WIA VK2 Division Sunday broadcasts will be relayed through all these repeaters, and the VK1 broadcast fed back up the link into VK2.

VK2RUW (8225) our UHF repeater is located 200" up a TV tower fed with 7/8" LDF 5-50 heliax. The antenna is a 20" long 10 dB gain collinear and the repeater runs 25 watts through a converted ex-telecom mobile duplexer. The repeater and all the associated systems are remotely controllable via 6 DTMF latches.

The entire system also has a "talking clock" attached which announces the time on the hour and will also tell you the time with the push of DTMF number "9". All inputs, 8225, the link from Goulburn and Canberra, as well as the 10 metre system, can control the DTMF functions (knowing the pin number of course) and can trigger the time announcement.

The 10 metre gateway has had considerable experimentation and "playing" by users but as yet no "DX" contacts. This is due to no one interstate knowing of the system and the poor sunspot cycle.

Rob also supplied these technical details about the 10 metre to 70 cm gateway.

The gateway is simplex, not duplex, receiving and transmitting on 29.290 MHz. Receiver sensitivity is excellent with the receiver noise mute based on the Philips 828 circuit. We wanted a reliable mute that would not constantly false open the 10 metre system. (After all most of the users are "fugitives" from the pager noise on the 2 metre band!). The 828 mute has proven to be very reliable and was copied directly, with the addition of a pot to control the mute hysteresis, which is set for about 2 dB.

The only problem we have frequency-wise is that the Goulburn link radio we are using has an IF on, would you believe, 29.800 MHz! This has proven to be the main problem presently running the 100 Watt PA (the link radio is a Philips 747).

Exciter output is 10 Watts and the PA output 100 Watt using an old "CB" HF amplifier. The antenna is a side-mounted dipole at 100" fed via a 1 to 1 ferrite balun and military standard RG-213. The repeater site is the main TV and FM transmitting site for the NSW south coast.

A "pseudo-tail" has been installed on the 10 metre system. When using a normal duplex repeater you can ascertain repeater access by transmitting and listening for the "tail". With a simplex system the receiver and transmitter operate on the same channel. To inform users if they can access the gateway, 2 seconds after the 10 metre receiver's mute closes, the transmitter is keyed for either 2 seconds (while QSO is taking place) or will announce the system's identification.

The ident is a "real" female voice with added reverb (for a good sound), stored in Eprom. The ident is announced with every triggering of the receiver on 29.290 MHz, but will cease when a QSO starts. The ident announcement is "This is VK2RUW, the Wollongong New South Wales 10 metre simplex gateway". A talking clock announces the local time on the hour. Pushing DTMF "9" while transmitting will also trigger the clock announcement.

When work on the gateway started, the new regulations allowing limited licensees on to 10 metres was only months away, but we're still waiting! The gateway can easily be remotely disconnected via DTMF to allow for current regulations. Once the new regulations are released this will not be a problem.

Thanks Rob for the information on the gateway system, look forward to working it soon.

PS. My hard to spell word for the month....LICENSEES...I hope this is right *(Spot on! Ed.)*

**21 Waterloo Cr Lesmurdie 6076 VK6UU @ VK6BBS*

ar

Spotlight On SWLing

Robin L Harwood VK7RH

I recently received an audience questionnaire from Radio Moscow International, asking for my opinions on their performance at the time of the political crisis in April of this year. It ironically arrived on the day when a far more serious crisis erupted in Moscow with virtual civil war breaking out between the opposing political forces.

One of the interesting queries from them was did I rely on Radio Moscow's newscasts to ascertain what was happening within Russia or did I listen to other broadcasters to find out what was happening? I don't personally recollect what my reactions were to the earlier broadcasts in April, yet I am finding out more about what is happening now on the streets of Moscow from foreign broadcasters than from Radio Moscow International. At the time I am compiling this it is still unclear who has emerged on top.

At the height of the latest Moscow crisis, I hurriedly raced to my receiver, only to find that a little furry visitor had left its calling cards behind the receiver. I had visions that it had chewed through the collection of wires and cables but fortunately it was all OK. So we have left a little titbit there to deter any further exploration. We have two canine companions and they are both in disgrace for failing to catch this small furry unwelcome pest in our house. I guess that we may have to acquire a feline companion now to do the necessary.

But to return to Radio Moscow. I note that they are making monthly alterations to their frequency schedules. For example, 7150 kHz was heard in September from about 1100 UTC with their English Service but, as from 26th of September, they shifted to another channel. For a while this frequency of 7150 was a mess. Especially when Radio Australia in Darwin came on in Vietnamese around 1230 UTC. Other monitors overseas have also noted this erratic frequency behaviour of Russian external services.

I have been doing some listening down on the top end of the medium wave allocation and have been able to hear some high powered American AM stations. These are believed to be located on the West coast and are rated at about 50 kilowatts. One station is on 1580 kHz and has a "Country and Western" format. Although there is one outlet in Arizona listed as being on this channel at 50 kilowatts, I have insufficient information to make a positive identification yet. Another American is heard on 1420 kHz also with a similar format. This is a clear channel here in Australia. Identification can be difficult as other broadcasters are weakly heard on the channel at times. The best times to observe these signals from North America is from the local sunset until about 1200 UTC. Just don't assume that because there is a 50 kilowatt listed in the WRTH, that indeed is the signal you are hearing. There will be a lot of fading and you will need a lot of patience to positively identify them.

The 70th Anniversary of the first public broadcasting station in Australia falls due on the 13th of this month. Radio 2SB in Sydney commenced on this date in 1923 and is still operational although now with the callsign of 2BL. It is the ABC flagship in Sydney. Radio 2FC commenced just three weeks later and on longwave at that. This is now 2RN Radio National. 2BL and 2FC were originally separate stations with different owners but were merged when the Australian Broadcasting Commission commenced on July 1st 1932. Happy 70th Birthday 2BL!

Well, that is all for this month. Don't forget, if you have any news, you can send it to me at 52 Connaught Crescent, West Launceston TAS 7250 or via Packet at VK7RH @ VK7BBS.

73 from Robin L. Harwood VK7RH.

ar

Pounding Brass

*Stephen P Smith VK2SPS**

I am writing this column in September, so as to give myself a little breather over the Christmas break. Where has the year gone? Just think, 1994 is just around the corner.

I am looking forward to the Mellish Reef Expedition (VK9M) and the VK/ZL Oceania contest in October. For the CW section of the contest (9/10 October), I trust that you all pulled out your keys and put in a good showing.

This month we will look at an overview of the telegraph system within the United States of America.

The telegraph was a phenomenal improvement in communications and it radically changed society. Telegraphers were held in high regard and called "lightning slingers". Operators themselves, awed by what they were able to do, pointed to the Bible verse Job 38.35 "Canst thou send lightnings, that they may go and say unto thee, "Here we are?"" as applying to them. About a dozen competing telegraph companies were consolidated in 1856 to form Western Union, establishing a nation-wide private enterprise communications network whose effects led to far-reaching commercial and social changes. Communication that formerly took weeks could be accomplished in a matter of minutes. This was most dramatically demonstrated about 15 years after commercial telegraph service began.

In 1860, letters sent via the Pony Express (officially the Central Overland California and Pike's Peak Express Company) typically took 10 days from St Joseph, Missouri to Sacramento, California — a vast improvement over sending mail via ship around Cape Horn. Completion of the overland telegraph line on October 21, 1861 made it possible to send a message from coast to coast in an hour or two; three days later the Pony Express went bankrupt, ruining many investors.

Railroads quickly adopted the telegraph for communications and it vastly speeded up train operation. In 1851, Erie Railroad Superintendent Charles Minot was on a westbound train waiting at Harriman, New York to meet an opposing train. Meeting points were fixed by timetable and, if one train was late, the other just had to wait. Impatient Minot had the telegrapher ascertain from Goshen if the eastward train had left there. It had not, so Minot sent a message to Goshen for the operator there to hold that train until his own arrived and wrote out an order for his train to proceed against the overdue eastward train. The engineer refused to obey the order, so Minot took the throttle and the engineer boarded the train's rear car, certain a collision was inevitable.

On arrival at Goshen the opposing train had still not arrived so the process was repeated and eventually the two trains met at Port Jervis, saving much time for the westbound train. From this incident the system of "train dispatching" evolved, so called because it used telegraphic dispatches (then spelled "despatches") to control train movements.

Both Union and Confederate forces employed the telegraph during the Civil War, and here also it radically changed the way things were done. Telegraph

operators, many of them civilians, became indispensable to the conduct of the war, their messages enabling officers to more quickly assess the size and location of enemy forces and react much faster than before. On some occasions a telegrapher went aloft in a balloon carrying a Morse set and trailing wires to earth, to report on enemy troop dispositions. Certainly this kind of scouting was a distinct improvement over conventional intelligence-gathering methods.

Operators became adept at tapping and eavesdropping on enemy circuits. Some even imitated the sending characteristics of enemy operators to send false messages, and at times they taunted opposing operators by letting them know their traffic had been overheard.

Noted persons who began their careers as telegraphers included Andrew Carnegie, Jessie H. Bunnell (Civil War operator and later a leading manufacturer of telegraph equipment), Richard Sears (founder of Sears, Roebuck), Gene Autry and Chet Huntley (NBC news co-anchor). Many railroad officials, including some residents, began as telegraphers, and a sizeable number of telegraphers who worked in stock brokerages or commodity exchanges went on to success in those fields. Thomas Edison began work in the 1860s as a telegraph operator and his first experimental efforts were telegraph related.

Morse code was not suited to the trans Atlantic cables, nor for use in Europe, so a variation, international Morse code, emerged in 1851. When wireless came into use, both codes were used for a time, resulting in confusion and errors when European ships were in American waters, and vice versa. Following the sinking of the Titanic in April 1912, International Morse was made the standard for radio use. In Morse's first experiments the speed of transmission was about 10 words per minute. With "sound reading" it increased to about 40 wpm, near the limit for sending on a hand key. Use of the typewriter made copying much easier, while the Phillips Code, a glossary of abbreviations introduced in 1879 by Walter P. Phillips, increased sending speeds. When the semi-automatic "Vibroplex" telegraph key was introduced by Horace Martin in 1904, the combination of Vibroplex, typewriter, Phillips Code and skilled operators made communication speeds in excess of 60 wpm commonplace.

The telegraph was used not only by Western Union, Postal Telegraph and railroads, but by many other businesses — mining companies, meat packing houses, automobile manufacturers, oil pipelines, radio networks, telephone companies, stock brokers and commodity traders. A Quebec beer maker connected its offices in Montreal to the brewery in Lanchine with an eight mile line.

One of the more interesting uses of the telegraph was reporting baseball games for radio broadcast. A telegrapher at the ball park sent a play-by-play account to the radio station back in the visiting team's home city. There another telegrapher copied the account, periodically handing slips of paper to an announcer who described the action and attempted to sound as though he was at the game. A system of shorthand was used: for example, SIC meant "strike one, called"; PTF "pitcher throws to first; "B2 OS" ball two, outside" and so on. This system developed into something of an art and several broadcasters became well known. Announcer "Red" Barber and Western Union telegrapher Harry Moorman, working for the Cincinnati Reds, were a particularly accomplished duo. Former President Ronald Reagan, fresh out of college and working as a sports reporter for station WHO in Des Moines, was another who took part in these re-creations, which ended shortly after World War II when improved long distance telephone facilities made broadcasting from remote sites feasible. *(For a few years, something similar was done in Australia with overseas Test cricket broadcasts. Ed).*

Very early in the telegraph era, North American telegraphers began to refer to novice and inept operators as "HAMS", which possibly derived from "ham-minded". Most pioneer wireless operators came from wire telegrapher ranks so when early amateur radio operators began to interfere with commercial traffic, they immediately condemned the interlopers as "HAMS" and the epithet soon came to include all amateurs.

This concludes the overview of the telegraph. Next month we will look at how the telegraph came to Australia. Until then best wishes.

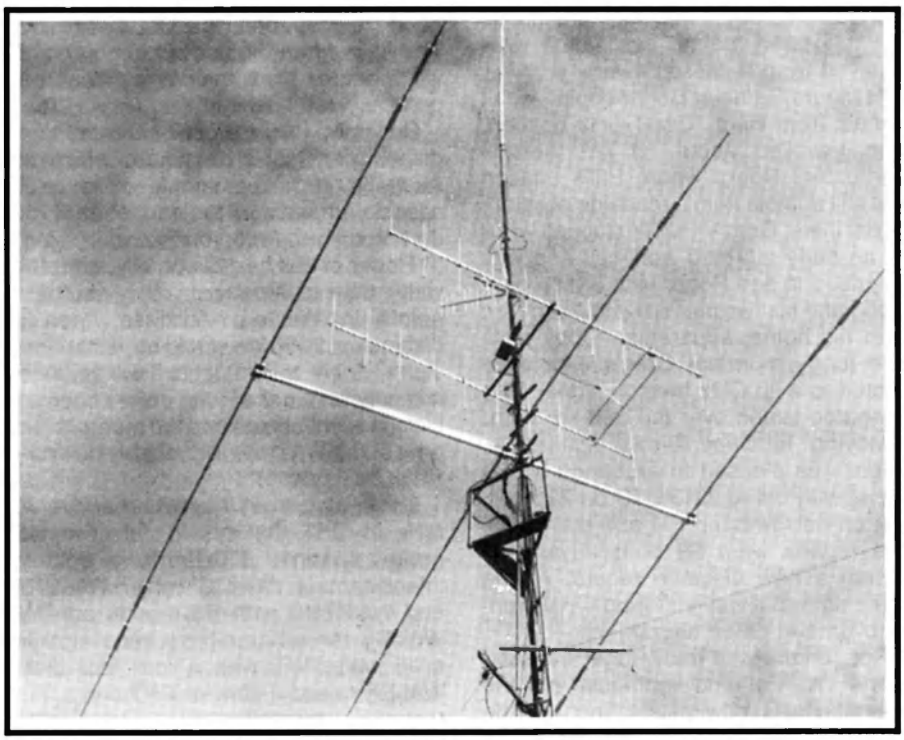
*PO Box 361 Mona Vale NSW 2103

ar

Repeaters — Additions, Deletions, Alterations. Have you advised the WIA of changes needed to the Repeater list

Truckie's Travels

Ian Rosser VK2XB/VK2WAG continues his humorous anecdotes as an interstate truck driver.*



The antenna farm of VK2JUG (now VK2EO) that "bit the dust" in high winds.

Well, it seems I have been absent from the keyboard for an extended period of time. This can be easily explained, folks. I have to work for a living (strange as it may seem!). Much to the confusion (and amusement) of the general public, the poor old truckie is required to work his backside off in order to support the lifestyle the rest of Australia takes for granted! Oh well ... ho hum!

It seems there are some people around the traps who just can't seem to keep their antennas in the air. I wouldn't like to name anybody, but the callsigns of VK2JUG (now VK2EO), VK2FMB and VK2ZOO come to mind. They tell me that a certain great tribander in the Lemon Tree Passage area made severe contact with terra firma — much to the consternation of his neighbours. They tell me this particular fellow has now erected an even BIGGER array! Something in the order of a TH6! Is this what our late Federal President meant by "Good neighbour policy"?

Another fellow in the Glen Innes area (who shall also remain nameless ... hello, Mike!!!) who is a keen 160 m freak had this enormous, full sized 160 m vertical that had withstood the rigours of drought, snow, pestilence and the odd "blow" (anyone who has been in that area in winter will know what I mean) and was claimed to be indestructible. Well, let me tell you something ... No antenna is able to withstand Murphy for too long! Mike's antenna had a little dispute with a tree, or rather the guy wires did, with the result that this mechanical marvel made a somewhat untidy mess on his front lawn. Mike assures me that when he rebuilds said device he will be documenting it for all the 160 m enthusiasts out there.

This same man is the resident repeater guru wind generator designer/builder extraordinaire-cum-radio repairer and everything else for the upper tablelands. Take a bow, Mike. Your work is appreciated by all of us who travel through the area.

Some repeaters that MAY NOT be in your lists, or you may not know of their effective range:

146.750 Tamworth — covers from Scone to Tenterfield across to Gunnedah

146.925 Walcha — quite good coverage on New England north of Rocky Gully (near Bendemeer)

147.075 Walcha — fills in the holes of the above

146.950 Glen Innes — I have worked this one from as far down as Goonoo Goonoo (south of Tamworth) right through to the Queensland border on the New England Highway.

The linked UHF repeaters of Wollongong/Goulburn are first rate, and I have worked Chris VK2XQW through these quite a bit in the wee small hours as I have travelled south to Melbourne and returned. Chris lives at Terrigal, near Gosford. We have managed to maintain contact most of the time on UHF over travelling distances for me of a couple of hundred kilometres. If you don't believe me, ask Chris.

A view of the feedpoint of VK2FMB's 160 m vertical.

The VK3RNE UHF repeater is also very good and I have worked it almost all the way to Wagga Wagga and beyond Holbrook as I have travelled on both the Hume Highway and the Olympic Way.

There is a whole raft of other repeaters whose ranges I can report, but they will have to wait for another occasion as this truckie is leaving for Brisbane for delivery on Monday 12/4/93 ... I'll bet you all had that day off!

Cheers until next time.

Indianna VK2XB/VK2WAG

(Note: Ian would welcome news items for his columns, preferably via packet VK2XB @ VK2EHQ or TCPIP VK2XB AMPR ORG (44.136.17.23). Ed).

* *13 Pemworth Close, Wyoming, NSW 2250*

ar

VHF/UHF An Expanding World

*Eric Jamieson VK5LP**

All times are UTC

10 GHz Activity in VK5

On Thursday 22 April Roger **VK5NY** portable at Cape Banks lighthouse QF02EC, near Carpenter Rocks, and **Bill VK5ACY** portable at Minarapa PF84RG, near Parndana, Kangaroo Island, worked 10 GHz narrow band SSB and FM with 5x9 signal reports exchanged both ways over a path of 355.4 km, setting a new national record for that band.

Roger having achieved his WAC on six metres, the first in VK5, and with the eventual departure of DX from that band, about a year ago set out to build gear for 10 GHz, using two systems each with a 406.4 mm dish and penny feed running 160 mW of power, with an FT290R to provide the 144 MHz IF. Following early experiments on short paths and nobody else to work on narrow band, it became necessary to go further afield.

With this in mind, Roger travelled to Kangaroo Island on 3 April and left with Bill the second unit. Contacts were made from Cape Jervis to Bill on Kangaroo Island with S9+ signals. From his home QTH of Mount Wilson PF94HS, a 118 km path, Roger found that his TH6 antenna on the 24.4 m tower proved to be an excellent reflector to the island and was able to set the dish by the shack door and work Bill by scatter from the TH6!

Further portable tests from north of Adelaide at Two Wells to the sea-level site at Kingscote on Kangaroo Island provided good signals but with flutter over the 144 km path. From Mount Barker and Hoad's Hill through the Mount Lofty Ranges to the island provided good results.

On 7 March, with Bill at Vivonne Bay, KI, Roger travelled to Kingston but the 255 km path provided no signals. On 12 March Roger, while at Binney Lookout near Meningie, worked Bill at Mount McDonald over the 212 km path. On 17 April, Roger drove again to Kingston and at nearby The Granites worked Bill at 5x9+ with a 250 km path. Driving on to a hill near inland Mount Burr in the south east, and from South End on the coast, no contacts were made.

On 21 April Bill reported excellent signals to VK3 and VK7 on VHF and UHF, so they decided to go portable again, Bill at Minarapa area near Parndana on Kangaroo Island. Roger, following the south east coast made 5x9+ contacts to Bill from The Granites, Cape Jaffa, Robe, Beachport and South End, the latter being the location of no signals on the previous Saturday. It was apparent that on this occasion some assistance was received from a coastal inversion.

At Mount Gambier Roger copied weak signals from Bill's 10.368 GHz beacon, then travelled about 10 km towards Carpenters Rocks where Bill's beacon was still audible from a roadside position. Whilst there, Greg VK5ZGY stopped while on an early morning work-call and was surprised to see Roger with a dish on a tripod and his two metre beam, many km from his home, apparently happy on a cold foggy morning! Greg's ears were treated to a 10 GHz beacon signal from Kangaroo Island over the 350 km path.

Moving to Cape Banks lighthouse, Roger was pleased to exchange an S9 signal with Bill at 2213 UTC on 22 April, first on narrow-band FM and then SSB. The reports were S9 both ways, thus setting a new distance record. At the same time, Bill was suffering QRM from an overhead Orion aircraft!

Not content with that, Roger travelled to the VK3 Portland lighthouse but the inversion was now dissipating and no contacts were made and the two metre link was suffering from strong QSB. Roger found that the heat of the day being re-radiated from the rock surfaces near the cliff had caused a noticeable degradation in the receiver noise figure when pointing the dish in Bill's direction. A last try from the look-out tower at Mount Richmond produced no signals. The dish just clearing the tree line could detect heat noise from the tree foliage adjacent to the tower. After a long night of driving and suffering a condition Roger called "microwave fatigue," it was decided to return home.

10 GHz narrow band is a new exciting experience for VK operators, from available kits or rolling your own. The UK RSGB Microwave Committee Components Service, now run privately, and the German DB6NT Short Kits, are sufficient to ensure operation on this exciting band with a suitable 144 MHz IF, without the need for professional test equipment. Roger suggests the UK kits and for the more experienced UHF home constructor the German kit which does not provide construction detail nor a number of components, whereas the UK kits provide detailed construction manuals and all the hard to find components. Some 200 transverter kits have been supplied to date. These kits provide a rewarding opportunity and enjoyment for home constructors to embark into the microwave arena.

English and European distances over 1000 km have been achieved and contacts over 200 km are very common; even EME contacts have been made. When conditions are right the 10 GHz band provides contacts equal to 144 MHz. The days when the use of plumbing and wave guides were the norm are all but gone.

Recently, a source of 57 cm aluminium dishes for 10 GHz became available in Australia at a reasonable price, plus associated parts, relays and feeds if you do not wish to "roll your own."
(If Roger or Bill can eventually span the water path to Albany or other southern points in Western Australia, then a distance of 2000 km would be within their sights. There is little doubt it will be done, it is only a matter of time before such an historic event occurs and the man with the gear at the WA end will probably be Wally VK6KZ .... VK5LP).

I note also from *The World above 50 MHz* in QST that on 18 July two US groups spanned 865 km for a notable inland contact. W6HCC worked WA6EXV and WA6OWD with S8 reports on CW. W6HCC ran a home-brew transverter in a 15 watt TWT with a four foot dish. WA6EXV used a 40 watt TWT and a four foot dish, while WA6OWD had the same antenna and a 10 watt TWT. The US continental record for the 10 GHz band is 957 km.

Queensland

Lance **VK4ZAZ** writes to say that six metres has been very quiet in the Brisbane area. He hopes the sudden but expected demise of Cycle 22 may usher in a good Es season with multiple hop paths providing some surprises.

John VK4TL from Malanda in North Queensland has the following to report on six metres during the winter period. 3/6: JA5CMO; 5/6: JH1WHS, JI1HFJ, JI7NQW, JK7QYZ; 6/6: JT1KAA; 19/6: VK2PB, VK2XN, ZL3TY, VK2TNT, VK2BKL; 3/7: P29BPL/b; 4/7: ZL2TPY; 24/7: JA7WSK; 18/8: VK8AH; 27/8: JH1WHS; 28/8: JA1VOK, JH1WHS, JL1GHQ/p. John has also received confirmation of his contact with T20AA on 27/03/93.

Ron **VK4BRG** sends a copy of a recent Packet message which reads *VK9MM Mellish Reef worked at 0632 on 20 September. He was heard weakly on 50.120 SSB calling CQ. Once he heard me he reported turning his beam and signals were 5x9 each way. He also reported I was their first six metre contact. He was heard later calling with fast CW.*

Ron also reports that during September an inversion brought in 2 metres and 70

cm repeaters from as far south as Bundaberg, a distance of around 700 km. Best contacts were at 2115 on 19/9 to VK4KAB and VK4WPK, both in Bundaberg, on 439.0 MHz simplex.

New Caledonia on two metres

Ron **VK4BRG** also reports that around 0757 on 21/9 he was trying to raise the Bundaberg repeater on 146.800 when he heard a strange ident, which turned out to be the repeater in Noumea. He worked Eddie FK8CR and Guy FK8DH with 5x9 signals. He then worked FK8DH direct on 145 MHz FM with signals 5x9 each way. They tried 70 cm but no results. The distance is about 1500 km.

Ron said the repeater remained audible for nearly four hours until 1145 when he ceased observation. He tried again next morning but the band had closed. Ron worked seven different FK8s via the repeater and they mentioned that during the past few days they had been working into the Bundaberg and Gladstone areas.

When one looks at the map distances there seems no reason why two metre contacts should not also be possible with Lord Howe Is, Norfolk Is, Vanuatu, Solomon Is and even Fiji. However, I am not aware of any operators with two metre capabilities, let alone on any higher band.

The obvious reason for lack of contacts are the missing dedicated VHF operators, which is understandable given the remoteness of the locations. Most help would come from the establishment of two metre repeaters — at least they would give an Australian operator a chance to alert someone, whereas a beacon could churn away for hours without response. Oh well. I suppose it is really only wishful thinking on my part!

First worked from Australia

Lance **VK4ZAZ** also referred to the above list and said that I had not included any of the KA prefixes which were assigned the US personnel in the immediate post-war occupation of Japan. He mentions KA7AX on 22/06/60 together with other KA stations active around that time.

I suppose it can be said that the KA calls are located in Japan and thus not a different country, but then you have the Vatican City in Italy and the United Nations in the US counting for DXCC, so there may be little difference. Anyway, have you an opinion on the above and are there any claims for working KA stations? If so, please send call-sign, date, time and mode.

Six metre repeater

A message, which arrived too late for inclusion last month, came from John **VK3ATQ** to say that he and **Mark VK3NZY** had been involved in the establishment of a six metre repeater on Mount Lookout in the Gippsland area. The call-sign is **VK3RMR** and it operates on 53.6/52.6 MHz with a nominal output of 25 watts and is powered from solar panels. The power could be increased to 100 watts with the installation of more panels. A diplexer is used in conjunction with a pair of in-phase 5/8 wavelength vertical antennas mounted on a 30.5 m tower. The antenna gain is 6-7 dB.

Reports of contacts via the repeater would be appreciated by either John or Mark. Brisbane stations are amongst the most favoured distances to use the repeater during the coming Es season. Given a good Es opening, across town signals could be stronger via the repeater than direct!

Report from the USA

Emil Pocock W3EP, writing in his QST columns *The World Above 50 MHz*, says that on 50 MHz Es openings during July were nearly as extensive as in June. Larry Lambert N0LL (EM09) who is strategically placed near the centre of the continental 48 states, reported Es on all but seven days in July. The eastern half of the country worked Europe on at least three days, coast-to-coast double-hop conditions appeared on at least two evenings, and propagation to the Caribbean was good on several occasions.

CU1EZ in the Azores Islands (HM76) reported openings to the US and Canada on 5 and 6 July between 2100 and 0000. On 5/7 Antonio's log shows three dozen contacts stretching from New York in the north, Ohio to the west and Georgia to the south. He also worked several stations in Texas. On 6/7 he included Ontario in Canada to his list.

Emil says the Azores Islands are strategically situated one Es hop from much of Europe and two hops from north-eastern USA. The log from CU1EZ shows long runs of European contacts immediately followed by US stations, although at times he can work both ways simultaneously!

With the reports of excellent Es conditions prevailing in the US and Europe during their recent summer, there exists the real possibility that the southern hemisphere may be given a similar treat. It will not be long before we know.

Moonbounce for Satellite Operators

That's the big heading in the October issue of QST's *The World Above 50 MHz*. **Emil W3EP** reports that working through OSCAR 13, Mir, RS-10 and other spacecraft isn't the only way to work DX via satellite. For two decades reflected signals from the moon have been used to make DX contacts.

On 6 and 7 November, the Toronto VHF Society will operate VE3ONT on 144, 432 and 1296 MHz using the Algonquin Radio Observatory's 150-foot dish antenna. The Institute for Space and Terrestrial Science, which operates the big dish, has invited a group headed by Dennis Mungham, VE3ASO, and Michael Owen, W9IP, to instal amateur equipment at the site. The fabulous gain of the antenna, sensitive receivers and high power transmitters will allow VE3ONT to make EME contacts with most OSCAR-class stations.

The Algonquin dish has about 34 dBi gain at 144 MHz, 43 dBi at 432 MHz and 53 dBi at 1296 MHz. The VE3ONT operators will mount special left-hand circular polarised helical antennas at the feed point and install 1500 watt transmitters on 144 and 432 MHz and 100 watts on 1296 MHz. You should be able to work VE3ONT via the moon with 100 watts on 144 and 432 MHz and at least 25 watts on 1296 MHz. Right-hand circularly polarised antennas will work best, but horizontal or vertical antennas will be nearly as effective.

OSCAR stations should track the moon as with any other satellite. Stations with antennas fixed horizontally also have an excellent chance to make contact but only during the 30 to 60 minutes when the moon is near the horizon. Moon rise and set times can be found in a good almanac, from the daily paper or a moon-tracking system.

VE3ONT will operate split frequency to reduce confusion and interference. Operators plan to call CQ on 6/11 between 0340 and 1700 on 432.050 and listen from 432.050 to 432.060. On 7/11, operating times are 0450 to 1730 on 1296.050 and receive 1296.050 to 1296.060. The only 144 MHz schedule was on 10/10 but this advice is too late for that band. It is suggested CW will be the best mode for responding. If conditions are poor VE3ONT may switch to 30 second sequencing. In that case the big dish will transmit during the first 30 seconds of each minute and listen during the second 30 seconds, even though this is not standard procedure. Emil suggests you figure out how VE3ONT is operating before calling. The VE3ONT operators are accepting no schedules, but liaison will be maintained on 14.345 MHz during the day.

I am not sure how readily Australian amateurs can use the above information but I thought you should be aware of this interesting event. Delivery time of AR should give you several days to prepare for the occasion — so good luck. Some

years ago when WA6LET conducted 144 MHz experiments from the large Stanford University dish, I was successful in receiving a number of EME stations using a stacked pair of 13 element yagis. As expected, the signals were not strong but were recorded on tape. I tried transmitting with my modest 100 watts but did not receive a reply which was no surprise as my local conditions were not good due to pouring rain!

Closure

From the lack of correspondence it appears very few operators are involved in outstanding contacts. So far the spring equinox appears not to have provided any F2 contacts. Due to the many thunderstorms, for most of the past week my antennas have been disconnected from all equipment, which is not an aid to operating.

However, the Es season will be all but upon us by the time you read these notes. Please write with any news of special contacts. Keep a watch on 144 MHz for Es openings during short-skip on six metres.

Late news of importance

Last month I reported on the inland openings to Sydney, Canberra and Tasmania on 144 MHz, principally by Roger VK5NY and Bill VK5ACY, during June and July, all thanks to the VK5VF two metre beacon.

Well, its been done again. Just before 11 pm local on Tuesday 5 October, Roger VK5NY on Mount Wilson near McLaren Vale, was about to climb into bed when he received a phone call from Mike VK2FLR in Sydney to say the VK5VF two metre beacon was audible.

Mike, with Chris VK1DO and Charlie VK3BRZ on the 3690/5 KHz VHF liaison net, had been discussing the weather and decided to check band conditions on two metres and found the Adelaide beacon. As a result of the call, Roger made the following contacts on two metres SSB: 1319 VK2FLR 5x2 sent, 5x2 received; 1320 VK3BRZ 5x9, 5x9; 1322 VK1DO 5x2, 5x4; 1323 VK2ZAB 5x4, 5x4; 1328 VK2ZRU 5x2, 5x3; 1617 VK3KWA 5x9, 5x9; 1626 VK3ZGJ 5x6, 5x6; 2126 VK3AUG 5x3, 5x3; 2130 VK3DUT 5x9, 5x9; 2138 VK3AFW 5x6, 5x6; 2146 VK3CY 5x8, 5x8; 2147 VK3BBB 5x8, 5x8; 2229 VK2FLR 5x2 to 5/5 each way; 2242 VK1DO 5x5, 5x5; 0001 VK1VP 5x2, 4x3 to 5/3, but Eddie was having trouble with local noise and being situated behind Black Mountain in Canberra did not help. Roger said an interesting factor was that the stations worked were on a broad beam heading with no readily defined peak.

On Kangaroo Island, Bill VK5ACY worked VK2FLR. Mick VK5ZDR worked VK2FLR and VK1DO; VK5KCX worked VK2WWW at Gilgandra, west of Sydney. VK5ZVA at Port Neill worked VK3CY and VK3DUT. All these stations probably worked other stations than those listed, but at least they were there. Roger VK5NY phoned me during the morning and I tried two metres with VK2FLR and VK1DO but I was only able to hear the odd word from both stations, despite my mast-head pre-amp.

There is no question that the operators involved generally had very efficient stations using large antenna systems and knew what they had to do when it came to weather patterns. They were dedicated to the extent that they stayed out of bed all night to make use of the conditions.

On 70 cm Roger VK5NY worked at 1526 VK1DO 5x2, 5x5. Chris had been copying Roger earlier but due to an antenna fault his SWR was too high so he had to move up from 432.100 to make better use of his 70 watts. Roger also worked at 1617 VK3KWA 5x2, 5x8; 2300 VK1DO 5x2, 5x5.

Now on to the soap-box — again! This latest round of contacts was only made possible through the signals provided by VK5VF, the Adelaide two metre beacon. Thanks to the work of David VK5KK and the occasional helper, he ensures the Adelaide beacons remain on the air continuously, are efficient and make good use of their excellent site on Mount Lofty.

From their central location in the southern regions of the continent, no other beacons can provide the early warnings as does VK5VF, and if ever the value of beacons needed to be demonstrated, here is an excellent example. In particular, the two metre beacon provides signals which can be monitored in both an easterly and westerly direction — resulting this year in coast to coast contacts from VK5 to Perth in the west and Sydney to the east.

With some dismay, I recently learnt that the VK6RTW beacon in Albany is turned off during the winter months, which seems to defeat its purpose as winter contacts are not unknown. The Mount Gambier beacon is also missed and I am never sure what is available from Victoria. The Sydney beacons are well sited and maintained for continuous operation. The Canberra beacon does its best but a good site is not available.

Gordon VK2ZAB said it is seven years since similar openings occurred and these would have been at a low point between solar cycles. This tends to further support my long time expounded view that Es improves considerably during the absence of F2 propagation on six metres, in turn leading to increased Es contacts on two metres. A relationship may also exist between the above situation and certain tropospheric conditions, and with happenings as occurred last night, we may be on the path to learning more about propagation, particularly over land.

Finally, it would be a decided advantage to have a central body which could oversee the siting of beacons and assist with the provision of actual beacons or provide finance for them to be constructed. In the UK there are several people, like Geoff GJ4ICD, who build beacons and send them to places where they are needed. It seems a pity that we cannot do the same.

Closing with two thoughts for the month:

1. Thunder is good; thunder is impressive. But it is lightning that does the work; and
2. Card games can be expensive, but so can any game where you hold hands.

73 from The Voice by the Lake.

**69 Meningie SA 5264*

ar

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make: ALINCO
Model: DR112T
Serial Number: 0006697
Type: 2 m FM Transceiver
Accessories: Part of mounting bracket, microphone
Modifications: Nil
Stolen from: private car — by smashing drivers's window
Date: 13 Sep 1993
Other items taken: Panasonic AM/FM stereo Radio/Cassette
Reported to: Canberra Police
Owner: Andrew Davis, 30 Crowder Cct, Stirling ACT
Callsign: VK1DA
Contact details:
Home Phone (06) 287 1011
Work Phone (06) 263 2007

ar

Have you advised the the SMA of your new address?

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

"Over to Fail"

Amateur Radio gives many people enjoyment, not the least being one of chasing new prefixes. It's a quest that may never be satisfied, due to the endless combinations available and those which appear to be "dreamed up".

Most have some basis for issue, be it for a local event, national milestone etc, etc. However, recently one was heard that I thought was in very poor taste, and a sad reflection of politics intruding into the bands. I refer to "R10F", commemorating the shooting down of the Korean Airliner over the disputed Islands north of Japan by the Russians.

What do other members think about such issues?

Neil Penfold VK6NE
2 Moss Court
Kingsley WA 6026

Another Channel 0

I noted with interest the item in the VK2 broadcast on 19th September regarding interference from stereo TV transmissions on channels 0 and 5A and, in particular, the letter from the Australian Broadcasting Authority which stated in part that all channel 0 transmitters in NSW referred to by the WIA had been cleared.

I would like to point out that Prime Television operates a stereo channel 0 service in Tamworth. Furthermore, this station has a positive carrier offset such that the secondary sound carrier is on 52.005 MHz — actually inside our "exclusive" allocation!

It was originally proposed that this service would move to UHF with the commencement of aggregation in 1992, however Prime objected and decided to remain on channel 0 permanently.

I can only assume that either the WIA did not consider this particular transmitter worthy of mention in their correspondence with the ABA, or that the ABA itself is unaware of its existence.

Jeff Pages VK2BYY
11 Graham St
Tamworth NSW 2340

Interesting QSLs

Have just read the contribution about QSL information by VK3TL, which I found most interesting (September issue of *Amateur Radio*).

Ken called on me some five years ago and was given access to my card collection, of which he selected some to be of interest to his current activities.

I have since forwarded him a few more, which I hope he finds worthy of adding to his exhibition.

No doubt Ken will find a few more interesting items to produce, from time to time. *(We look forward to them too. Ed)*

Tom Laidler VK5TL
18 Albion Ave
Glandore SA 5037
ar

Technical Correspondence

Antenna Doubts

With reference to the article "Simply, an all band antenna", by George Thatcher VK2EHN, in the September issue of *Amateur Radio.*

About ten years ago I bought one of these "Black CTW" antennas. Not the same as the vertical version described, but the "other" Black CTW, that is an actual dipole in physical shape. It also came in two types, one for 80 m and the other for 2.0 MHz. I bought the latter version.

I always had mixed success, despite numerous trials in the way it was hung in the air. The brochure suggested that it be as high as possible, in practical terms. Initially this was not done and only one leg was actually "skyward", the other being the ground counterpoise. Later it was indeed hung as a dipole, with the three points hung on separate poles about six metres high. Possibly they ought to have been twice that again, but I didn't have that sort of length available to use.

However, it never was as flat as claimed, with a peak of five to one near 40 m and near to flat on other bands. It also seemed to be deaf when compared to any other antenna that I had. As well, it seemed not to be radiating as it should.

To be fair, I have seen the vertical version working at one fellow amateur's abode, and can only assume that either my antenna is not a good one, or the installation of it, or both.

Which is a pity, as I would have liked to use it particularly on the lower bands, instead of my existing 160m dipole.

Peter Scales VK6IS
Box 47 Chidlow WA 6556
ar

Silent Keys

The WIA regrets to announce the recent passing of:-

W J (William)	TREZONA	VK3ZEM
J (Jim)	STEVENS	VK3ZK
E K	WILLIAMS	VK4VDD

ar

Editor's Comment

Continued from page 3

meantime, so the change is hardly noticeable.

Our organisation, as we well know, consists of seven autonomous Divisions. Sometimes it seems that our founding fathers chose words more prophetically than they knew. Not only do we now, from time to time, find there is division between Divisions, not to mention between Divisions and Federal, but there is even division inside some Divisions!

If amateur radio is to survive in Australia it will only be as a result of a united front presented by the WIA to all who would seek to take privileges from us. Particularly is this so as regards spectrum space in these days of market based spectrum management.

We need divisions between us like we need the proverbial "holes in the head". We need union, not division, to take us "beyond 2000".

Our future is in our own hands!

Bill Rice VK3ABP
Editor
ar

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

ar

VK EAST — MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.8	-2	8.1	3	-5	-16	-34	...
2	10.5	-8	8.1	0	-5	-15	-32	...
3	14.4	0	11.2	0	1	-3	-12	-25
4	21.2	6	16.3	-4	5	6	3	-3
5	27.4	8	21.0	-9	5	9	9	7
6	28.6	10	22.9	-11	5	10	11	10
7	27.9	10	22.8	-10	5	10	11	9
8	27.1	10	22.0	-7	7	11	11	9
9	26.0	11	21.6	0	11	13	12	9
10	24.9	14	20.0	9	16	16	14	9
11	23.7	17	19.0	19	21	19	15	8
12	22.7	20	16.1	27	26	22	15	7
13	22.1	22	17.6	34	29	24	16	7
14	21.3	24	16.9	37	31	24	15	5
15	20.5	25	16.6	38	30	23	13	2
16	19.3	26	15.1	38	29	21	10	-2
17	18.2	27	14.1	37	27	18	8	-7
18	16.8	28	13.0	35	24	14	0	-14
19	15.8	29	12.1	33	21	10	-4	-21
20	16.4	28	12.5	34	23	12	-2	-18
21	16.0	25	11.8	29	18	7	-8	-25
22	14.6	22	11.2	22	13	2	-13	-31
23	14.2	17	11.0	17	9	0	-15	-32
24	13.0	10	9.8	10	3	-7	-22	...

VK EAST — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.8	26	24.7	35	37	36	33	28
2	30.3	26	25.0	36	38	36	33	29
3	30.3	27	24.9	37	38	37	34	29
4	29.9	27	24.5	38	39	37	34	29
5	29.1	28	23.7	40	40	38	34	29
6	28.1	29	22.8	44	42	39	34	26
7	26.9	31	21.7	48	44	40	34	27
8	25.6	32	20.6	50	45	40	33	26
9	24.3	33	19.5	50	44	39	32	23
10	23.2	34	18.5	50	44	38	30	21
11	22.5	34	17.9	50	43	37	29	19
12	21.6	35	17.1	50	43	36	27	17
13	20.6	36	16.2	49	41	34	24	14
14	19.4	37	15.1	46	40	32	21	9
15	18.2	38	14.1	47	36	29	17	5
16	16.9	39	13.0	45	35	25	12	-1
17	15.8	40	12.0	44	32	22	6	-6
18	16.4	38	12.4	44	34	24	10	-3
19	19.3	34	14.5	42	36	29	19	8
20	23.3	30	17.7	40	37	33	27	19
21	26.2	28	20.3	36	36	35	30	24
22	27.3	28	21.5	37	37	35	31	26
23	27.9	27	22.3	35	37	35	31	26
24	28.7	27	23.4	35	37	35	32	27

VK EAST — AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.7	10	11.0	10	9	3	-7	-20
2	15.0	7	11.5	6	6	1	-8	-20
3	15.4	4	11.7	2	5	1	-6	-17
4	18.4	5	13.8	-1	5	5	0	-7
5	21.5	6	15.0	-4	5	6	4	-1
6	21.6	6	15.1	-6	4	6	4	-1
7	21.7	6	15.2	-6	4	6	4	-1
8	21.6	7	15.1	-4	5	7	4	-1
9	20.9	8	15.1	-1	7	7	4	-2
10	19.8	9	14.9	3	9	8	3	-4
11	18.7	10	14.7	8	11	8	1	-7
12	17.7	12	14.1	11	12	8	0	-11
13	16.9	15	13.4	16	14	8	-2	-14
14	16.3	19	12.9	21	15	8	-4	-18
15	15.7	23	12.3	26	17	7	-6	-22
16	15.0	26	11.6	28	17	6	-9	-27
17	14.4	28	11.0	28	16	3	-13	-32
18	13.8	29	10.5	28	14	1	-17	-37
19	13.6	30	10.1	28	13	0	-19	-39
20	14.2	29	9.7	29	15	2	-15	-35
21	13.7	25	9.4	24	11	-1	-18	-38
22	13.2	21	9.1	19	8	-3	-20	...
23	13.2	16	9.2	15	6	-4	-19	-38
24	14.0	13	9.7	13	7	-1	-15	-31

VK EAST — EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.4	-3	8.2	2	-6	-18	-37	...
2	9.6	-10	7.6	0	-7	-19	-38	...
3	9.6	-14	7.6	0	-6	-17	-34	...
4	11.4	-9	6.8	-1	-3	-10	-24	...
5	14.6	-1	11.6	-2	1	-2	-11	-23
6	18.3	3	14.7	-4	3	3	-2	-10
7	21.4	6	17.2	-4	5	6	3	-2
8	23.6	9	19.1	-1	8	10	8	3
9	25.1	12	20.3	6	14	15	12	7
10	24.8	16	20.0	18	22	20	16	10
11	23.6	20	19.0	28	27	24	18	10
12	22.7	22	18.2	33	30	25	18	9
13	22.2	23	17.7	36	31	25	17	7
14	21.5	22	17.0	37	30	22	12	1
15	19.2	23	15.2	36	26	17	5	-8
16	16.7	25	13.6	33	21	9	-6	-23
17	14.7	27	11.6	28	14	0	-19	...
18	12.8	28	10.1	23	5	-12	-35	...
19	11.7	29	9.2	18	-2	-21	...	...
20	11.0	29	8.6	15	-7	-28	...	...
21	10.6	25	8.2	11	-10	-30	...	...
22	10.6	18	8.4	9	-9	-28	...	...
23	10.8	10	8.4	7	-6	-21	...	...
24	10.9	4	8.5	5	-5	-18	-38	...

VK EAST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.7	7	16.3	-1	7	7	4	-2
2	19.3	8	14.6	4	9	6	0	-6
3	17.1	10	12.9	9	9	4	-5	-17
4	15.7	12	11.8	13	9	1	-10	-25
5	14.8	16	11.1	17	9	0	-15	-33
6	14.0	20	10.5	20	9	-3	-21	...
7	13.5	25	10.3	23	8	-6	-26	...
8	13.5	26	10.1	24	8	-6	-27	...
9	13.2	28	10.0	24	6	-7	-29	...
10	12.2	29	9.2	21	2	-15	...	...
11	10.6	31	8.1	14	-8	-30	...	...
12	10.5	31	8.1	14	-9	-31	...	...
13	13.5	28	10.0	25	9	-6	-27	...
14	13.4	29	10.4	26	10	-4	-24	...
15	13.1	23	10.1	20	7	-6	-25	...
16	16.8	19	12.9	21	17	9	-1	-14
17	15.5	13	11.9	12	10	4	-7	-20
18	16.1	7	12.2	5	7	3	-5	-16
19	19.0	7	14.3	0	6	6	1	-6
20	22.9	8	17.5	-6	5	8	6	2
21	25.8	8	20.0	-10	4	9	9	6
22	26.8	8	21.1	-11	4	8	9	7
23	26.6	7	20.2	-10	4	8	8	5
24	24.4	7	18.5	-6	6	8	7	2

VK EAST — ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.0	15	23.7	16	22	23	20	16
2	30.3	13	23.2	14	21	22	20	16
3	30.8	13	24.0	14	21	22	20	17
4	31.7	13	24.1	15	22	23	22	18
5	31.6	15	24.9	17	24	25	23	20
6	30.6	16	25.1	20	26	26	23	19
7	29.5	17	24.0	25	28	27	23	18
8	28.2	18	23.5	32	32	29	24	18
9	27.1	20	21.9	39	36	31	25	17
10	25.9	21	20.8	41	36	31	23	15
11	25.0	22	20.0	42	36	30	22	13
12	24.6	22	19.6	43	37	30	22	12
13	23.8	23	18.8	44	36	29	20	10
14	22.7	23	18.1	43	35	27	17	6
15	21.1	24	16.5	41	32	24	12	0
16	19.6	24	15.3	39	29	19	6	-7
17	17.8	25	13.6	36	24	13	-2	-19
18	16.2	25	12.5	32	18	4	-14	-34
19	13.1	26	10.1	21	1	-19	...	...
20	12.9	26	10.0	20	-1	-21	...	...
21	18.0	20	13.6	29	20	9	-5	-21
22	25.8	16	20.0	29	28	24	18	10
23	27.7	16	22.1	23	26	25	21	15
24	28.0	15	22.6	16	23	23	20	15

VK EAST — EUROPE (long path)

UTC	MUF	dBU	FOT	14.2	16.1	21.2	24.9	28.5
1	10.9	-5	8.2	1	-2	-11	-26	...
2	11.2	0	8.5	3	-2	-11	-26	...
3	11.2	4	8.6	5	-1	-12	-28	...
4	10.8	6	8.3	6	-3	-15	-34	...
5	9.9	9	7.7	6	-7	-22	...	...
6	9.9	16	7.8	8	-8	-25	...	...
7	11.8	23	9.3	17	1	-13	-35	...
8	15.1	24	12.1	26	15	4	-11	-29
9	15.5	24	11.8	26	18	9	-3	-17
10	15.5	17	11.7	17	13	7	-3	-16
11	17.9	11	14.2	9	11	8	1	-7
12	17.2	5	13.6	0	5	4	-1	-9
13	16.5	0	13.3	-6	2	1	-3	-10
14	15.8	-4	12.3	-9	0	0	-4	-12
15	15.1	-8	11.6	-11	-2	-1	-6	-13
16	14.4	-11	11.0	-12	-2	-2	-7	-14
17	14.1	-12	10.6	-11	-2	-2	-7	-15
18	14.9	-10	11.1	-13	-2	-2	-6	-13
19	17.1	-4	13.4	-13	-2	-1	-4	-10
20	15.2	-7	11.8	-10	-2	-2	-7	-15
21	13.3	-9	10.2	-6	-1	-4	-11	-22
22	12.1	-10	9.3	-3	-1	-6	-15	-28
23	11.3	-10	8.6	-1	-2	-8	-19	-34
24	11.0	-8	8.3	0	-2	-10	-23	-39

VK SOUTH — AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.9	15	11.5	15	12	6	-5	-18
2	18.5	12	12.4	12	11	6	-3	-15
3	19.5	11	14.9	9	12	10	4	-4
4	22.0	10	15.7	4	11	11	7	1
5	22.0	9	15.7	1	9	9	6	0
6	22.0	8	15.7	-1	8	9	6	0
7	21.6	8	15.5	-1	7	8	5	0
8	21.6	8	15.4	-1	7	8	5	0
9	21.5	9	15.2	1	8	9	5	0
10	20.7	10	14.7	4	10	9	5	-2
11	19.7	11	13.9	8	12	9	3	-4
12	18.4	13	12.9	12	13	9	1	-8
13	17.3	15	12.1	16	14	8	-1	-13
14	16.3	16	11.4	21	15	7	-4	-18
15	15.8	23	11.0	26	17	7	-6	-22
18	15.1	26	10.5	28	17	5	-10	-27
17	14.6	27	10.1	28	16	4	-13	-31
18	14.1	28	9.9	26	14	1	-16	-36
19	13.9	29	9.7	28	14	0	-18	-38
20	14.1	29	10.0	29	15	1	-16	-36
21	14.5	27	10.1	26	15	3	-13	-32
22	14.1	24	9.9	23	12	1	-15	-34
23	14.2	20	9.9	20	11	0	-15	-33
24	15.0	17	10.6	16	11	3	-10	-26

VK SOUTH — ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.4	13	17.9	11	15	14	9	2
2	22.7	12	18.4	9	15	14	9	2
3	23.1	12	19.1	8	15	14	10	3
4	23.1	12	19.1	9	15	14	10	4
5	23.0	13	18.9	10	16	15	10	4
6	22.7	14	18.6	13	17	15	10	3
7	22.3	15	18.2	17	19	16	10	2
8	21.7	17	17.6	22	22	18	10	1
9	20.9	21	16.9	33	27	20	10	0
10	19.9	23	16.0	38	27	19	7	-5
11	18.9	24	15.2	36	26	17	3	-11
12	18.0	24	14.3	35	24	13	-1	-17
13	17.3	25	13.7	35	22	11	-4	-22
14	18.7	25	13.2	33	20	8	-9	-27
15	18.0	26	12.6	32	18	5	-13	-33
16	15.3	26	12.0	30	15	0	-19	...
17	14.6	26	11.3	28	11	-4	-25	...
16	13.8	26	10.6	25	6	-11	-35	...
19	11.5	25	8.9	10	-16	...	...	...
20	11.3	25	8.8	9	-19	...	...	...
21	15.9	19	12.0	24	11	-2	-20	...
22	19.0	18	14.4	23	19	12	2	-10
23	21.1	15	16.3	18	18	15	8	-1
24	22.0	14	17.3	14	17	15	9	1

VK SOUTH — USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.6	8	17.8	-2	8	9	7	2
2	20.9	9	15.9	4	10	9	4	-3
3	18.6	11	14.1	9	11	7	0	-10
4	17.1	13	12.9	13	12	6	-4	-16
5	16.2	16	12.2	18	12	4	-8	-22
6	15.3	19	11.5	21	12	2	-12	-29
7	14.6	23	11.1	24	12	0	-17	-36
8	14.4	25	10.8	26	12	0	-19	-39
9	14.0	27	10.6	26	11	-3	-22	...
10	12.6	29	9.6	23	5	-11	-34	...
11	10.8	30	8.3	15	-7	-28	...	...
12	10.6	30	8.2	14	-8	-29	...	...
13	14.0	28	10.4	27	11	-3	-22	...
14	15.2	28	11.7	31	19	7	-9	-27
15	14.9	23	11.4	24	14	4	-10	-28
16	15.3	16	11.7	17	12	4	-8	-22
17	14.9	9	11.2	9	7	1	-9	-23
18	15.7	5	11.7	3	5	2	-6	-17
19	18.1	5	14.2	-2	5	4	0	-8
20	21.1	6	15.9	-8	3	6	4	-1
21	23.5	7	18.0	-11	3	6	6	3
22	24.7	7	19.2	-13	2	7	7	5
23	25.3	6	20.0	-12	3	8	8	6
24	25.4	8	20.0	-8	5	9	9	6

VK WEST — EUROPE (Long path)

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.9	-19	7.6	-3	-6	-14	-28	...
2	10.1	-15	7.8	-3	-7	-15	-30	...
3	10.0	-11	7.8	-2	-8	-18	-34	...
4	9.6	-8	7.5	-1	-10	-21	...	...
5	8.8	-7	6.9	-2	-14	-28	...	...
6	8.8	-3	7.0	-1	-15	-31	...	...
7	10.1	6	8.0	3	-11	-26	...	...
8	12.6	13	10.1	10	0	-12	-30	...
9	15.8	15	12.6	17	10	1	-12	-27
10	16.0	17	12.4	20	13	5	-7	-21
11	13.1	16	10.1	14	4	-6	-22	...
12	12.6	9	9.7	8	1	-8	-22	...
13	16.4	6	11.2	5	6	2	-5	-15
14	15.8	0	10.7	-3	1	0	-7	-16
15	15.2	-5	10.5	-8	-2	-3	-8	-17
16	14.6	-10	9.9	-11	-3	-4	-9	-17
17	14.0	-13	9.6	-12	-4	-5	-10	-18
18	13.8	-15	9.3	-13	-5	-5	-11	-19
19	13.5	-16	9.3	-13	-5	-5	-11	-19
20	13.2	-15	9.9	-11	-5	-6	-13	-22
21	11.8	-21	9.1	-9	-5	-8	-17	-28
22	10.6	-32	8.3	-13	-11	-16	-26	...
23	10.1	-33	7.8	-12	-11	-18	-30	...
24	9.8	-27	7.6	-7	-9	-16	-29	...

VK SOUTH — EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.1	2	8.6	4	-4	-16	-35	...
2	10.3	-6	8.0	1	-6	-17	-36	...
3	10.3	-10	8.1	0	-5	-15	-31	...
4	12.3	-6	9.4	-1	-1	-7	-19	-34
5	18.1	0	12.8	-5	1	0	-7	-16
6	20.3	4	16.2	-8	2	4	1	-4
7	23.3	6	18.8	-11	3	6	5	1
8	23.4	8	19.1	-10	4	8	7	4
9	23.0	9	18.6	-6	6	9	8	4
10	22.1	11	17.9	1	10	11	9	3
11	21.0	14	16.9	11	16	14	9	2
12	19.9	18	16.0	22	21	16	9	0
13	18.9	23	15.1	29	24	17	7	-4
14	18.1	25	14.3	33	25	17	5	-7
15	17.4	27	13.8	34	25	16	3	-11
16	16.8	28	13.2	34	24	14	0	-15
17	15.8	26	12.3	31	18	6	-11	-29
18	13.8	28	10.7	26	10	-4	-25	...
19	12.6	28	9.7	22	4	-13	-37	...
20	11.7	29	9.0	19	-1	-20	...	...
21	11.3	29	8.6	16	-4	-25	...	...
22	11.1	22	8.7	13	-5	-24	...	...
23	11.5	16	8.8	11	-3	-16	...	...
24	11.6	10	8.9	8	-2	-15	-35	...

VK WEST — AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	20	11.2	21	12	3	-11	-28
2	15.6	16	11.8	17	12	5	-7	-21
3	18.5	14	14.6	14	14	10	2	-8
4	22.5	12	17.3	10	15	14	9	2
5	23.0	11	17.0	6	13	12	9	2
6	23.0	10	18.9	3	11	11	8	2
7	22.8	10	18.7	2	10	11	7	1
8	22.6	9	18.4	2	10	10	7	1
9	22.2	10	18.1	3	10	10	7	0
10	21.8	10	17.7	5	12	11	6	0
11	21.0	12	17.3	9	13	11	6	-1
12	20.0	14	16.1	14	15	12	5	-4
13	18.9	16	15.1	19	17	12	3	-8
14	17.8	20	14.2	24	19	12	1	-12
15	17.0	23	13.5	29	21	11	-1	-16
16	16.4	26	13.0	31	21	10	-4	-20
17	15.8	27	12.7	31	20	8	-7	-24
18	15.1	28	11.8	31	18	6	-11	-29
19	14.5	29	11.2	30	16	3	-14	-34
20	13.9	30	10.6	29	14	0	-18	...
21	13.7	30	10.4	28	13	-1	-20	...
22	14.5	29	10.8	30	16	3	-15	-35
23	14.6	27	11.2	28	16	3	-13	-32
24	14.1	23	10.7	23	12	0	-16	-35

VK WEST — MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.8	9	7.5	2	-15	-34	...	...
2	9.7	0	7.5	0	-14	-31	...	...
3	13.4	4	10.0	5	0	-8	-23	...
4	19.9	8	15.3	4	8	6	0	-8
5	24.7	9	18.5	0	10	11	9	4
6	24.9	9	20.2	-3	8	10	9	5
7	24.9	9	20.5	-4	7	10	9	5
8	24.7	9	20.2	-4	7	10	9	5
9	24.1	9	19.7	-2	8	10	9	4
10	23.5	10	19.1	1	10	11	9	3
11	22.7	12	18.8	8	14	13	9	3
12	21.6	15	17.4	18	19	16	9	1
13	20.6	19	16.5	28	24	16	9	-1
14	19.7	23	15.7	33	26	19	8	-4
15	19.0	24	15.1	35	26	16	6	-6
16	18.4	25	14.5	35	25	16	4	-10
17	17.7	26	14.3	35	24	14	1	-14
18	16.8	26	13.1	34	22	11	-3	-19
19	15.9	27	12.4	32	19	8	-8	-28
20	14.9	27	11.5	30	16	3	-14	-34
21	14.2	28	10.8	28	13	0	-20	...
22	14.5	26	10.9	27	12	-3	-22	...
23	13.8	25	10.4	24	8	-7	-28...	
24	12.1	20	9.2	14	-1	-18	...	...

VK SOUTH — MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.7	1	8.2	4	-6	-18	-38	...
2	10.5	-6	8.1	1	-6	-17	-35	...
3	14.8	1	11.0	0	2	-2	-12	-24
4	22.2	7	17.1	-3	6	7	4	-1
5	24.8	8	20.4	-9	5	9	8	5
6	24.7	8	20.2	-11	3	7	8	5
7	24.4	7	19.9	-11	3	7	7	4
8	24.0	8	19.6	-10	4	8	7	4
9	23.6	8	19.1	-6	6	9	8	4
10	22.7	10	18.4	1	10	11	8	3
11	21.6	13	17.4	9	14	13	9	2
12	20.4	17	16.3	19	19	15	8	0
13	19.3	21	15.4	28	23	17	7	-3
14	18.4	24	14.6	33	25	17	5	-7
15	17.8	25	14.0	34	24	16	3	-10
16	17.1	26	13.5	34	24	14	0	-14
17	16.4	27	12.8	34	22	12	-2	-18
18	15.7	28	12.1	32	20	9	-6	-23
19	15.1	28	11.5	31	18	6	-10	-29
20	14.8	29	11.2	30	17	4	-12	-31
21	15.6	27	11.7	31	19	8	-7	-24
22	16.2	23	12.1	27	17	7	-7	-24
23	15.3	19	11.5	21	12	2	-12	-29
24	13.4	13	10.1	12	4	-6	-22	...

VK WEST — ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.5	16	21.1	19	23	22	18	12
2	26.8	15	21.6	16	21	21	18	12
3	27.6	15	22.6	15	21	21	18	13
4	28.8	15	21.9	15	21	22	20	15
5	29.5	15	23.5	15	22	23	21	17
6	29.7	16	24.3	17	23	24	22	18
7	29.4	16	24.2	20	25	25	22	18
8	28.6	17	23.4	24	27	26	23	17
9	27.6	19	22.5	31	31	28	23	17
10	26.5	21	22.1	41	37	32	25	17
11	25.4	22	20.5	43	37	31	23	14
12	24.2	22	19.4	43	36	30	21	11
13	23.3	23	18.6	43	35	28	18	8
14	22.8	23	18.1	43	35	27	17	8
15	22.1	23	17.4	42	34	26	15	3
16	21.1	23	16.6	41	32	23	11	-1
17	19.7	24	15.4	39	29	19	6	-8
18	18.5	24	14.4	37	25	14	0	-17
19	18.4	23	12.6	31	16	2	-17	-38
20	13.1	25	10.1	19	-2	-23	...	...
21	12.8	25	9.9	16	-5	-26	...	...
22	17.9	21	13.9	32	20	9	-6	-24
23	23.1	18	17.8	27	25	21	14	5
24	25.8	16	20.2	23	25	23	18	11

VK WEST — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.5	14	19.4	13	18	17	13	7
2	24.6	14	19.9	13	18	17	13	7
3	24.8	14	18.4	13	18	18	14	8
4	24.7	14	20.3	15	19	18	14	8
5	24.6	15	20.1	18	21	19	15	8
8	24.3	16	19.9	22	23	21	15	8
7	23.9	18	19.5	27	27	23	16	8
8	23.5	20	19.0	33	30	25	17	8
9	22.4	23	18.0	38	32	25	16	6
10	21.3	24	17.0	39	32	24	14	3
11	20.2	26	16.1	40	31	23	11	0
12	19.2	26	15.3	39	30	21	8	-5
13	18.4	27	14.6	39	28	18	5	-9
14	17.7	28	14.0	38	27	16	3	-12
15	17.0	29	13.4	37	25	14	0	-16
16	16.3	29	12.6	36	23	12	-3	-20
17	15.4	30	11.7	34	21	9	-7	-26
18	14.9	30	11.3	32	19	6	-11	-30
19	14.6	26	11.1	27	15	4	-13	-31
20	15.4	21	11.6	23	15	6	-8	-25
21	17.7	18	14.0	21	17	11	0	-12
22	20.6	16	15.6	18	18	15	6	-1
23	22.9	15	17.5	16	19	17	11	4
24	23.9	14	18.7	14	18	17	13	6

VK SOUTH — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.2	17	16.3	22	20	15	6	-5
2	20.4	17	16.8	22	21	15	6	-4
3	20.3	17	16.7	23	21	16	6	-4
4	20.2	18	16.6	25	22	16	6	-5
5	20.0	19	16.3	27	23	16	6	-5
6	19.7	21	16.0	30	24	17	6	-7
7	19.3	23	15.7	34	26	18	5	-8
8	18.6	26	15.1	38	27	17	3	-12
9	17.7	27	14.2	37	26	14	-1	-18
10	16.7	28	13.4	36	23	11	-6	-25
11	15.8	29	12.7	35	20	7	-11	-32
12	15.1	30	12.1	33	18	3	-16	-38
13	14.6	30	11.6	32	15	0	-21	...
14	14.1	31	11.1	30	13	-3	-25	...
15	13.5	31	10.5	28	10	-7	-31	...
16	12.9	32	9.6	26	6	-12	-37	...
17	12.3	32	9.4	24	2	-17	...	...
18	12.0	31	9.1	21	0	-19	...	...
19	12.7	24	9.5	20	3	-13	-37	...
20	14.5	20	10.7	21	10	-2	-20	...
21	16.8	19	12.7	22	16	7	-6	-22
22	18.7	18	14.3	23	19	12	1	-12
23	19.6	17	15.3	22	20	14	4	-7
24	20.1	17	15.9	22	20	15	6	-5

VK WEST — EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.6	13	9.0	9	-4	-19	...	...
2	10.7	4	8.4	3	-8	-23	...	...
3	10.7	-3	8.4	1	-7	-19	-39	...
4	13.0	0	9.8	1	-1	-9	-22	-38
5	17.2	3	13.7	-1	3	1	-6	-16
6	21.7	6	17.4	-4	5	6	3	-3
7	24.9	7	20.1	-7	5	8	7	3
8	27.1	8	22.0	-7	6	9	9	6
9	27.0	10	22.0	-6	7	11	11	8
10	26.2	11	21.3	-2	10	12	12	8
11	25.2	12	20.9	5	14	15	13	8
12	24.0	15	19.4	17	20	19	14	8
13	22.9	19	18.4	28	26	22	15	7
14	22.0	22	17.5	35	30	24	15	5
15	21.3	22	17.0	36	29	22	12	1
16	19.2	22	15.7	35	25	16	4	-10
17	17.0	24	13.2	32	20	9	-6	-23
18	14.8	26	11.4	28	13	0	-19	...
19	13.5	27	10.3	24	7	-8	-30	...
20	12.5	27	9.6	21	2	-15	...	...
21	12.0	28	9.1	16	-1	-20	...	...
22	11.6	28	9.2	18	-3	-22	...	...
23	12.1	25	9.2	17	-1	-19	...	...
24	12.2	19	9.4	14	-1	-16	-39	...

VK WEST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	21.4	6	16.1	-8	4	6	4	0
2	19.0	6	14.3	-3	5	5	1	-5
3	16.8	5	12.6	1	6	4	-2	-12
4	15.3	7	11.5	5	7	2	-7	-19
5	14.4	9	10.8	9	7	0	-11	-25
6	13.7	13	10.2	13	7	-1	-15	-32
7	13.2	17	10.0	16	7	-3	-19	-39
8	13.2	22	9.9	20	9	-3	-21	...
9	13.1	27	9.9	24	10	-4	-24	...
10	12.1	30	9.2	23	6	-10	-33	...
11	10.7	32	8.2	16	-3	-23	...	...
12	10.6	33	8.2	16	-3	-24	...	...
13	13.5	30	10.1	28	13	-1	-21	...
14	17.3	29	13.4	37	27	17	4	-10
15	14.3	27	11.0	27	16	4	-11	-29
16	13.9	21	10.7	21	12	2	-13	-30
17	16.1	17	12.4	17	15	9	-1	-14
18	15.3	10	11.7	9	10	5	-4	-16
19	14.8	4	11.2	3	6	2	-6	-17
20	15.6	2	11.8	-2	4	3	-3	-12
21	18.1	3	14.2	-7	3	4	1	-5
22	21.1	5	16.0	-13	2	5	5	1
23	23.5	7	18.1	-15	1	6	7	4
24	24.2	7	18.3	-13	2	7	7	3

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm OLD 4005. Ph (07) 358 2785.

FOR SALE ACT

● YAESU FT107DM tcvr with FV107 VFO FC107 ATU $800; YAESU FT212RH 2m tcvr $400; YAESU FT207R 2m handheld with all accessories $150; KENWOOD MC60A microphone $70. All in cartons with manuals. Greig VK1BSM (06) 231 5765.

● ATU MFJ-949B internal SWR meter, up to 300W, as new $165 O.N.O.; multi-band vertical (80-10m), Werner Wolf, handles 2kW, used only once, cost $299, sell $145 O.N.O. Bob VK1BOB (06) 295 3707 A.H.

● IC751 HF transceiver $1550 ONO; IC731 HF transceiver (same as IC735) $1650 ONO; AMIGA 2000 computer 3Mb RAM, twin drives, 1081 colour monitor $950 ONO. Markus VK1SK QTHR (063) 31 1136.

FOR SALE NSW

● ADVANCE 10MHz dual trace oscilloscope with probe s/n 00590 $300; SANSEI mini AF generator 10Hz-100KHz $50; VZ200 Computer with 16K RAM module and data cassette recorder $50. L. A. Brill, 32 Moore St, Ganmain NSW 2702, (069) 27 6406.

● YAESU FT101ZD HF xcvr, exc cond $650; HEWLETT PACKARD 2382A RS232 terminal with manuals $35; J-38 Telegraph key $25; PAKRATT 232 with Commodore 64 and interface $600. Kirt VK2DOJ (02) 436 2618.

● GULBRANSON upright radio with early 78 player about 1928-30 working order; EARLY Horn radio with power supply working order; 5 EARLY empty wood cabinets would use Horn speakers about 1926; PHILLIPS original multi tap power supplies; EMMCO original multi tap power supply; ANOTHER early Horn radio 99% complete about 1926-30; TWO Kriesler mantle bakelite radios (brown) working order; SOME early test equipment & other parts. All items cash NO CHEQUES. Please call day or evening. A. Walsh VK2TBW (048) 61 2092 or fax (048) 61 1536.

● QUANTITY brand new 807 valves in cartons, Chelmer brand (UK) $5.00 each plus postage. Craig VK2XRL, PO Box 290, Bowral NSW 2578, (018) 48 4589 AH.

● COLLECTORS item, COLLINS 75A-3 with manual $250; SIGNAL generator 10-500 MHz $450; DEVIATION/MOD meter $250. John VK2BJU (02 673 4305 evenings.

● KENWOOD TS440S tcvr c/w, mic, handbook, voice synthesizer in original carton vgc $1800; KENWOOD TH77A dualband h/held tcvr 2m/70cm fm as new complete $550. Peter VK2APP QTHR (063) 83 6206.

● COLLECTORS item Fluke DMM 8030A c/w SAFT nicads plug pack operational may need minor work suit technical type no leads full workshop manual $110 incl freight. Dogger VK2KSD OTHR (066) 77 9292.

FOR SALE VIC

● ICOM IC751 HF tcvr s/n 01309 with PS35 inbuilt mains psu and SM8 desk mike; ALSO AT500 ATU s/n 05255. Best offer. Tom VK3XBG QTHR (051) 94 2240.

● YAESU FT901DM Deluxe transceiver, 10 bands, digital readout, memory, 180 watts CW; ALSO SSB FSK AM and FM; PAIR 6146 final, built in Curtis keyer, filters, A.C. and 12 volt power supplies, instruction and service manuals included $900; YAESU TO901 Multiscope (tx and rx) matches the above $250. Both units in unmarked condition ex deceased Ham. Enquiries G. Lance VK3DS QTHR (053) 32 3226.

● ALINCO DJ-500T dual band 2m/70cm handheld xcvr with charger, Mic/spkr, original box, EC $425. Ron VK3OM QTHR (059) 44 3019

● ICOM IC701 6 band digital broadband transceiver with twin vfo's, vox, swr etc. Fully maintained, unmarked and in original box with instruction manual $850; ICOM IC701 ps heavy duty A.C. power supply and speaker, matches above, in original box and unmarked; ICOM microphones (desk and hand), cables, extension terminal and 100kc crystal marker $100. All would suit a new buyer and less than half the cheapest new unit price. G. Lance VK3DS QTHR (053) 32 3226.

● YAESU FRG-7 all band com/rx with manual $225. Jim VK3BCV QTHR (054) 60 4048.

● YAESU FRG-9600 all band all mode VHF/UHF scanning receiver little used, as new condition, half new price $490. H. Virgo VK3DVY (052) 21 6804.

● TH3JR good condition $125 ONO. Jim VK3BCV QTHR (054) 60 4048.

● KW2000E Transceiver s/n E377 ssb/cw vacuum tube HF bands c/w handbook circuits and matching mains power supply s/n E339 $100; YAESU FRG-7 wadley loop comms receiver s/n 7K 140477 c/w handbook circuits $250. O.B.O. Des VK3EDB QTHR (03) 836 1837.

● STRAIGHT Morse code key hi-mound HK707 excellent condition $50. Jack VK3MGE, 26 Thorpdale St, Newborough Vic 3825.

FOR SALE QLD

● SHIELDED room by Belling Lee, size 2500mm wide, high & deep. Includes 2 mains filters, light fitting & work bench. Disassembled but complete with all floor, wall & ceiling panels including a vent panel and a fingered-door panel. Will consider best offer. Gary VK4AR QTHR (07) 353 1695.

● HF LINEAR components QB3.5/750, 2 x 7129, 4 x 572B, 2 x 2.5/300 new tubes; VACUUM variable capacitors; ROLLER inductor; CERAMIC bandswitches. Sell or exchange for Heathkit or Yaesu station monitor, manual "Bug" morse keys, 2m gear etc. Doc VK4CMY (076) 85 2167 (AH).

● YAESU FL2500 linear 2000w s/n 503011 purchased overseas $650; NEW matched 6KD6 valves five $100; HEATHKIT SB200 Linear 1200w s/n 06351 purchased overseas $600; NEW matched pair 572B USA made $275; HAMII rotator plus 40m 8 core cable control box $450 O.N.O. Robby VK4YV QTHR (074) 43 8414.

● YAESU FT757 GX with HIGHMOUND morse paddle keyer, good condition $850; KENWOOD TS440S with auto ATU $1500. Geoff VK4ANP (074) 66 5476.

● RACAL RA217D com receiver good order $300; HP 608D sig gen 10-420mcs $100; YAESU FTDX560 tcvr good goer $250. Herb VK4KM (071) 64 2202.

● IC-725 HF all band transceiver $800; ICOM AH3 antenna tuner $400; PK-232 MBX data controller $500; PRIMAGE 90-GT printer $80; ROTOR Daiwa DR-7500 100 met cable $300; W G WULF 10 & 15 m.duo-band beam antenna $150; TOWER 21 metre home brew $300; POWER Sup home brew 25 amps $100. J. Gacesa VK4MEA (07) 271 2692.

● ICOM IC-720 c/w IC-PS15 p/s, KENWOOD Antenna tuner AT-130, OSKER SWR-200 and hamtenna M20.1, will not separate $800 the lot. L. Ferris VK4CAF (070) 53 6492.

● KENWOOD TS-680S HF & 6m transceiver and AT-250 auto ATU ec $1500; KENWOOD TM-741A full-featured fm multibander 2 mtrs, 70 & 23cmtr transceiver ec $1450; ALINCO Power supply 25A continuos $330. All items with original boxes and manuals, serials nos. Eric VK4NEF QTHR (07) 395 5327.

● CREED Teleprinter model 54, original, complete with dialler/PSU and manual, best offer for this collector's item; SHURE model 450 Desk microphone w/data sheet. v.g.c. $85 or exchange ICOM SM8 Desk Mike; ARA Issue 1 of Vol 1 and many later issues. Collector's item. Best offer; MOSLEY HF trapped vertical antenna w/radials, data sheet $90; DSE PSU 13.8v, 25A peak cap $150; SIDEBAND SE-502 10m base station, with circuit diagram, conversion info and Xtals for re-conversion to 11M $90. John VK4SZ QTHR (070) 61 3286.

● DECEASED ESTATE KENWOOD TS680S HF + 6m in original packing, manual, mike, leads, limited use $1450. Alan VK4FSI (074) 93 3665.

FOR SALE SA

● YAESU FT7B HF xcvr $450; YAESU FT709R 70cm h/hald c/w FNB3 nicad $250; KENWOOD AT-230 ATU $230. All in ex cond, orig packing, manuals etc. Terry VK5ATN QTHR (088) 63 1268.

FOR SALE TAS

● TS-440S clean condition little use c/w handbook and microphone. All in original carton $1600. Vic VK7VK QTHR (002) 57 8471.

● ICOM Transceiver IC-22A with IC-3PA power supply, both have manuals $170; YAESU FRG-7 receiver, vgc with manual $300; SUPER 80 computer with green screen monitor, tape drive, over 50 tapes of software, complete with technical and programming manuals and Z80 reference manual $150. Peter VK7KPB (002) 28 4110.

WANTED ACT

● FORTRAN compiler for antenna modelling on IBM pc. Dave VK1DT QTHR (06) 295 1874.

WANTED NSW

● YAESU FT990 or FT767GX or Kenwood 930 or 940. Alex VK2ALX (02) 907 9073 (AH).

● MILITARY radios type AR-17, 108, 109, 208, 11, 19, 22, B-40, R 1155, T 1154, Hallicrafters S-27 and/or S-27D; VALVE Tester — RCA WT-110A any condition; CIRCUIT Diagrams and/or manuals for the above sets and for B-41 rcvr; ACE radio wideband oscilloscope; AWA gated amplifier type A55765; AEI HV Power supply type R1103A. Photocopies OK. John Farmer (02) 888 9411 BH/AH.

● KINGSLEY radio AR7 speaker assembly for restoration, if not available would consider complete radio or parts of same. Grahame Foster (049) 49 8484.

● LINEAR amplifier for HF Q WARC not essential but must be in vg condn, top US brands preferred; PLATE transformer heavy duty suit psu linear also vacuum caps 1000pf; SWAP pair Amperex 4CX350F/8322 unused and cartoned for pair 4-400A or single 4-1000A, would also consider exchange for heavy duty 1500v-3000v plate transformer. Ron VK2ARJ QTHR (066) 53 6509.

● RADIO Vibrator oak type V5124 RAAF part number vibrator type C Y10D/70264 for museum project AR7 restoration. Stan Dogger VK2KSD QTHR.

● SERVICE Manuals/copies for H/P 5328A counter; KEITHLEY 104 w/band amplifier; FAIRCHILD TS452A/U; BALLANTINE 420 ac/dc calibrator; LEADER LSG221signal generator; BWD 112 signal generator; TRIO CO-1303A CRO. Will pay costs. Richard (063) 61 8529.

● WANTED BY Collector old & new morse keys. Magazines, books relating to morse code. Need as much material as possible for future book. Top prices paid. Steve VK2SPS (02) 99 2922 after 6.00 pm.

WANTED VIC

● NO 19 Military transceivers for Stuart Tank restoration, going or not going, also require manuals, headsets, mikes, power supplies etc. Eric Gibson VK3BEG, Churchill Vic (051) 22 2190.

WANTED QLD

● AR MAGS, tech books, data books, hand books anything related. Paul VK4YFF (070) 31 7895.

● POWER transformer for Telequipment servscope model D33. Fred VK4ZU QTHR (074) 97 4159.

● ICOM SM5 in vgc or SM8 desk mike; FL30, FL45 Filters; TOSHIBA T1200HB mother board in working order. John VK4SZ QTHR (070) 61 3286.

● TWO METRE mult mode tcvr base or mobile FT290R or similar — will consider ICOM 22S must be good condition. Gordon VK4KAL QTHR (079) 85 4168.

WANTED SA

● COLLINS KWM380, 75S3B, 32S2B, R390A/URR, R392/URR. Josef VK5QQ QTHR (08) 263 6377.

WANTED WA

● INTRUDER WATCH observers in VK6. Please help, free postage, logs, envelopes, advice. Our Division support intruder watch. Please support us. Thank you. Graham VK6RO Co-ordinator for WA QTHR (09) 451 3561.

MISCELLANEOUS

PLEASE SEND your donation of QSL cards, old or new, to the Hon Curator of WIA QSL Collection, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350. Let us save something for the future.

● THANK YOU "AR" and hams for assistance by sending info on Palec VCT tester now working exhibit in Murwillumbah Radio Museum VK2DMM. Stan Dogger VK2KSD QTHR. ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX NOVEMBER 1993

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable).....

Address:.....

.....

.....

State and Postcode:.....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yoesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

A simply brilliant price

Cat D-3600

$449

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

Ham heaven.

Some days Duncan thinks that he must have died and gone to heaven. Whichever way he turns he is surrounded by the finest ham radios around. What's a guy to do? He plays with them all day. And if that wasn't good enough, he gets paid for it as well.

Duncan Baxter...well VK 3LZ actually, let's call him by his 'real' name, is our resident ham radio expert. No one knows the Icom range better than VK 3LZ. He's been with us virtually from the start, some ten years in fact.

Now, if you'd like to find out about the latest in base stations, or virtually anything else to do with amateur radio operation, why not give VK 3LZ a call. Or you could simply drop in and see him at ham heaven ... err ... our head office that is.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call: (008) 338 915 Ph: (03) 529 7582 Fax: (03) 529 8485 A.C.N. 006 092 575

LL BROWN ADVERTISING 4558

AMATEUR RADIO

DECEMBER 1993
Volume 61 No 12

Journal of the Wireless Institute of Australia

IN THIS ISSUE:

Latest on New Regulations
Bandwidth Limiting LF Converter
Getting a Multiband HF Vertical to Go
Field Day Preparation

and lots more

YOU'D EXPECT A WORLD LEADER IN COMPACT COMMUNICATIONS TO HAVE AN IMPRESSIVE TRACK RECORD

New wave technology in every sense - Kenwood is the definitive way to keep in touch when you're at sea.

Pure as the driven snow - that's the sound quality you'll enjoy when you use Kenwood on cross country skiing trips.

Peak performance - thanks to the rugged reliability of Kenwood.

COMPACT TH-78A DUAL BAND TRANCEIVER

The TH-78A (144MHz/430MHz) sets exciting new standards for portable communication combining simplicity of operation with a multiplicity of sophisticated features. It is an innovative Dual Band Tranceiver ergonomically designed to meet the demands of the Amateur Radio world. Alphanumeric memory, multiple scan modes, DTSS and pager functions, dual-frequency receiver and multi-function memory channels are among the features found in this trendsetter.

Peter Brock

KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001 499 074)
P.O. Box 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia. TEL: (02) 746 1519 FAX: (02) 746 1509

N.S.W Argent Communications Blacktown (02) 671 3333, DX Engineering Port Maquarie (065) 849 922, Emona Electronics Sydney (02) 211 0988, F&B Amateur Electronics Ballina (066) 867 204, Lake Maquarie Communications Cardiff (049) 567 255, Macalec Pty Ltd Wollongong (042) 291 455, Reg Stockman Communications Inverell (067) 221 303, Action Communications Kingwood (047) 364 797, **A.C.T** Alex Johnson Aranda (06) 251 4920. **QLD** Emona Electronics Stones Corner (07) 394 2555, Mitchell Radio Co Albion (07) 357 6830, **VIC** Bairnsdale Communications Bairnsdale (051) 524 622, Emona Electronics Melbourne (03) 370 0330, Just Communications Mitcham (03) 873 4142, Measure Tech Supplies Dingly (03) 558 0566, Wecam Wendouree (053) 392 808, Stewart Electronics Components Huntingdale (03) 543 3733, **S.A** International Comms Systems Port Adelaide (08) 473 688, **W.A** Emona Electronics Victoria Park (09) 470 1118, Ford Electronics Osborne Park (09) 242 1766, Leda Electronics St James (09) 361 782, **TAS** Elgin Pty Ltd Launceston (003) 312 711, Elgin Pty Ltd Hobart (002) 344 500.

FOR AMATEUR RADIO USE ONLY

AMATEUR RADIO

Journal of the Wireless Institute of Australia

Vol 61 No 12 ISSN 0002-6859 December 1993

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

PUBLICATIONS COMMITTEE
Publisher
Bruce Thorne
Editor
Bill Rice VK3ABP
Production Editor
Bill Roper VK3BR
Senior Technical Editor
Peter Gibson VK3AZL
Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI
Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL
Contributing Editor
Ron Fisher VK3OM
ASSOCIATE EDITORS
Technical
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV
WIA News
Roger Harrison VK2ZTB
PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
DRAFTING
Vicki Griffin VK3BNK
ADVERTISING
June Fox
Brenda Edmonds VK3KT
CIRCULATION
Chris Russell VK3ARZ
Sue Allan

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
Amateur Radio
PO Box 300
Caulfield South VIC 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191
Business Hours: 9.30 am to 3 pm weekdays

Deadlines	Editorial	Hamads
January	29/11/93	01/12/93
February	10/01/94	12/01/94
March	07/02/94	09/02/94

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

CONTENTS

Cover

The Mellish Reef DXpedition — 18-27 September 1993.
Inset photo: Top left to right: John G3WGV, Atsu VK2BEX
Bottom left to right: Bill VK4CRR, Murray WA4DAN, Harry VK4DMH, Ken V73C, Vince K5VT, Steve P29DX.
Photos from Atsu VK2BEX

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 300, Caulfield South, Vic 3162
Telephone: (03) 528 5962
Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

Federal Secretary
Bruce Thorne
Office Manager
Donna Reilly

COUNCIL

President	Kevin Olds	VK1OK
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckert	VK2AOU
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK9,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
International Regulatory & RSG:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Federal QSP

In this the last month of yet another year, we have a mixed bag of subjects for this column. Let me begin with this magazine *Amateur Radio*. The then Production Editor, Bruce Bathols VK3UV, resigned in June to take up another appointment and his shoes were filled on a temporary basis by Bill Roper VK3BR. Bruce's plans were thwarted by a bout of poor health which necessitated a change in his plans. We wish Bruce a return to full health and best wishes in his new endeavours.

Bill's term as Production Editor has been extended to the end of 1994 during which time the Federal Council will be examining options for the production of *Amateur Radio* in future years to ensure that the most cost-effective method of production is used to bring you a magazine of which we can all be proud.

As we approach the festive season, it is a good time to reflect on what amateur radio means to us and what we get out of it. There has been comment recently, both within the amateur fraternity and in other publications, about the behaviour of a small number of amateurs in the way they pursue their hobby. Some of us, it seems, do not like to hear constructive comments on the quality of our transmissions and abuse those who attempt to inform us. The attitude of some who use the packet radio medium has also come in for comment recently. What some operators may not be prepared to say on air, they are prepared to put into "print" in the form of messages on the various bulletin board systems. Many of these messages are not fit for transmission through the packet networks and cause the Sysops of the various systems to expend many hours vetting the messages lodged on their systems to ensure they are suitable for transmission. Most Sysops feel a moral obligation to undertake this task, even though it is not yet required by law. However, if recent events overseas in this area are translated to the Australian environment, we may find Sysops held legally liable for the content of messages on their BBS systems.

A good New Year's resolution for all of us would be, critically, to examine our operating practices and ensure that we are being fair to our fellow amateur operators, and that we think before we speak or put fingers to keyboard so that our actions will not be seen as being anything other than those of a responsible body of people interested in furthering the aims of amateur radio. While we project a public image, whether consciously or not, that is anything other than this, it will be difficult for us to convince the authorities or the public at large that we are deserving of the band space and privileges which attach to our licences.

Finally, as Christmas approaches, on behalf of the Federal Council and the Federal Office, I wish you one and all a happy and safe Christmas and a prosperous New Year.

Kevin Olds VK1OK
Federal President
ar

Editor's Comment

Democracy

There are very few systems of governments or administration which do not claim to be "democratic". We have seen many cases in the last few years of the "Peoples' Democratic Republic of This, That or the Other" collapsing in chaos while its people run murderous riot in the streets. Strangely, most countries which may more truly claim to be democratic seem not to need the word in their title. They may have riots occasionally but they don't often collapse! Take the United States of America. Between 1861 and 1865 half the country tried to kill the other half! Yet in 1863, at Gettysburg, President Abraham Lincoln gave the world a superb definition of democracy; "Government of the People, BY the People FOR the People". The rest of the world, including the USA, is still trying to find the best way of achieving this noble aim.

A similar situation exists with organisations such as the WIA. Just as governments are necessary for countries, to do collectively what individuals cannot do, particularly internationally, so also are organisations necessary for special interests like amateur radio, and for just the same reasons. Organisations, like governments, consist of representatives. The question is, how should the representatives be chosen? It would seem better for the means of choice to be democratic. That is, chosen BY the members, FROM the members. There should be no argument that the organisation is FOR the members.

Can we honestly say that the WIA is a democratic organisation? Is it even possible that it exists more for some than others? Could it be that

Continued on page 55

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts		1994 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Hugh Blemings Don Hume	VK1DO VK1YYZ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary/ Treasurer (Office hours	Terry Ryeland Roger Harrison Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2UX VK2ZTB	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 5188. Some broadcast text can be found on the Packet network.	(F) (G) (S) (X)	$86.78 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530	VK3PC VK3XV VK3XLZ	1.840MHz AM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane OLD 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Marren Lance Bickford David Travis	VK4AMJ VK4ZAZ VK4ATR	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Bob Allan Maurie Hooper Bill Wardrop	VK5BJA VK5EA VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 146.5000, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Peter King	VK7GL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $83.65 $39.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times.

A Bandwidth Limiting LF Up Converter for Frequencies Around 200 kHz

Lloyd Butler VK5BR has a different approach to Low Frequency converter design, and it works!*

Introduction

Over recent years a few radio amateurs have ventured into experimental communications at frequencies around 200 kHz. Not many amateurs have receiving equipment for such low frequencies, and some might attempt building an LF up converter to operate in conjunction with their higher frequency receiver. The one I am about to describe is a little different from the usual design, and I must first introduce reasons for that difference.

I refer you to experimental CW transmissions on 196 kHz carried out by John Adcock VK3ACA and Don Bainbridge VK3BDJ at Gordon, Victoria. I monitored, in Adelaide, the 6th June 1992 tests, and the results obtained illustrate the points I wish to make. Using a receiver in a wide-band mode and connected to a long wire antenna, the signals were barely discernible amidst the inherent band noise. However, I was able to resolve these almost noise free with the following:

(1) *Limiting the receiver bandwidth* — As the CW signal is a narrow band mode, the noise bandwidth can also be reduced to no more than that required for reproduction of the signal.

(2) *Use of a tuned loop antenna* — The loop is less susceptible than the long wire to pick up of near-field noise. Its directional properties also enhance its ability to improve the signal-to-noise ratio (see Reference 1).

(3) *Use of a sharp audio filter* — As a single audio frequency keyed tone is produced by the receiver beat oscillator, audio bandwidth can also be limited to further reduce the noise.

If one adds an LF converter to an existing receiver, the first requirement to limit the bandwidth might be satisfied if the receiver has a crystal filter. Many receivers have such a filter fitted in the 455 kHz IF chain, but what do we do if no such filter is installed? One might consider making modifications to the receiver, but this could prove to be difficult or messy. The question I am raising is how bandwidth limiting might be achieved in the add-on converter circuit itself. At VLF (say 20 kHz) this can easily be achieved in the front end using a high Q circuit. For example, at 20 kHz a tuned circuit with a Q of 100 has a 3 dB bandwidth of only 200 Hz, which is suitable for the narrow band signal. However, at 200 kHz, the same Q of 100 gives 2000 Hz bandwidth, too wide for our purpose. So, at 200 kHz, we need some other means of narrowing the bandwidth, and this has led to the particular LF converter design which I will discuss.

A Different Arrangement

The usual form of LF up converter is shown in figure 1. The LF signal is mixed with a fixed frequency oscillator (usually crystal locked) to produce a higher first intermediate frequency at which the front end of the receiver is set. The incoming LF frequency is selected by tuning the receiver frequency to provide, in effect, a variable first intermediate frequency.

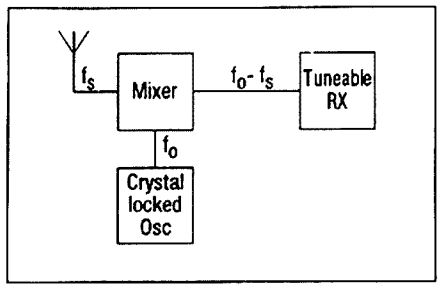


Figure 1 — Usual form of converter.

To achieve bandwidth limiting, I have rearranged the conversion circuit so that the oscillator is variable and the first intermediate frequency (or receiver input frequency) is fixed, allowing the insertion of a crystal filter at that fixed frequency (the changed arrangement is shown in figure 2). The incoming LF frequency is now selected by tuning the oscillator instead of the receiver. To satisfy the second requirement listed earlier, the tuned front end also incorporates a loop antenna.

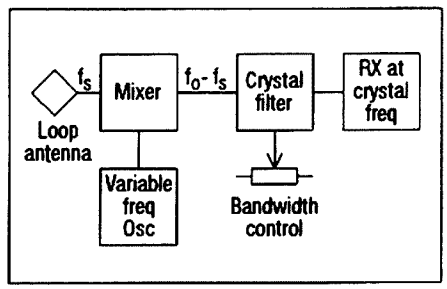


Figure 2 — Converter re-arrangement to limit bandwidth.

Choice of Crystal Frequency

My original idea was to convert up to 3.5 MHz and make use of a crystal around this frequency. Most radio amateurs would have a transceiver which operates on 3.5 MHz even if they have nothing else. However, tests on a crystal filter using crystals around this frequency produced bandwidths around 400-600 Hz. I thought this was too wide, and finished up using a crystal of 1.5 MHz, which produced a bandwidth of around 200-250 Hz. Of course, the precise frequency is not important, but I happened to have a crystal on 1.5 MHz which sits right at the end of the broadcast band. One might prefer to use a crystal on the amateur band at 1.8 MHz, and this could be expected to produce a somewhat similar bandwidth. In any case, the bandwidth varies a little with the Q of individual crystals.

The Circuit

The circuit of the LF converter, less the variable frequency oscillator (VFO), is shown in figure 3. A loop antenna as specified forms the inductance for input tuning at LF. This operates indoors and is connected to the tuning capacitor and interface amplifier via 150 cm of RG58 coaxial cable. The loop tunes between 180 and 370 kHz, using a three-gang 10 to 450 pF tuning capacitor with its three sections paralleled. The tuning range can be extended down to 150 kHz by switching in parallel a fixed capacitor of 470 pF. The length of the cable can be increased with some reduction in the upper frequency limit due to the increased residual capacity caused by the cable. As discussed in the introduction, the loop antenna helps to further improve the signal to noise ratio.

The LF353 JFET operational amplifier package N1 interfaces the loop and the mixer stage. The high impedance input of N1A prevents loading of the loop and the stage provides RF gain. The low impedance output of follower stage N1B drives the mixer stage V1, V2.

The amplified LF signal is mixed with the output of the VFO in the balanced mixer stage. The balanced form of mixer is considered desirable

"The tuning range can be extended down to 150 kHz . . ."

to prevent any significant level of VFO signal from reaching the receiver. The receiver input circuits might otherwise be not able to attenuate sufficiently the VFO signal which is only 150-370 kHz above the 1.5 MHz intermediate frequency. The discrete component balanced mixer using MPF131 transistors was used simply because I had a card already wired up but discarded from a previous project. Otherwise I might have considered using a balanced modulator package such as the MC1496. The balanced mixer shown incorporates a balancing potentiometer RV1. This is set for minimum VFO level at the secondary of T2.

The output from the mixer is fed via crystal filter T3-X1 etc. Potentiometer RV2 controls the bandwidth of the circuit. When the potentiometer is at maximum resistance, it has little effect on the performance of the crystal and the bandwidth is set to its minimum value by the characteristics of the filter. At minimum resistance, the crystal is shorted out and the bandwidth is set by the loop antenna Q in conjunction with the receiver inherent bandwidth. By adjusting the setting of the potentiometer, a bandwidth can be selected as desired between the two conditions. For better spread of adjustment, a logarithmic potentiometer is used. This must be connected for maximum resistance when set fully clockwise.

Trimmer capacitor C10 balances out the crystal holder capacity so that the crystal operates in a series resonant mode. The setting of C10 depends on the style of crystal unit. An easy way to set C10 is to tune the

LF converter/receiver to a frequency where only noise is received. With RV2 set for minimum bandwidth, C10 is adjusted for minimum noise as indicated on the receiver S meter, or as heard in the speaker.

The crystal filter output is fed to the receiver input via interface emitter follower stage V3. The connection between converter and receiver is shielded to prevent pickup of signals direct into the receiver. The converter cannot be used with a receiver which incorporates a loop stick in its front-end tuning. The loop stick does a fine job of picking up signals in its own right and, of course, must be switched out to prevent interference from those signals. The receiver I used had a loop stick on the broadcast band, but fortunately the next band with standard coils also extended to 1.5 MHz.

The VFO

To tune the LF range of 150-370 kHz, the VFO must be tunable between 1.65 and 1.87 MHz. For best performance of the balanced mixer used, the output of the VFO needed to be in the order of several volts peak to peak. In tuning the VFO, its frequency has to be set quite accurately because of the limiting bandwidth of the crystal filter. The tuning control must therefore be coupled to a good vernier reduction drive and the oscillator frequency must be reasonably stable.

As it happened, I had a VFO ready-made for another project that was put aside, and it was only a matter of changing the frequency range of the tuning. The circuit as shown in figure 4 was based on a design originally published in Break-in. Rob Gurr

"The multitude of NDB stations above 200 kHz . . . provides plenty of test signals . . ."

VK5RG introduced me to the circuit some years ago and, as it seemed to work quite well, I have used it on several projects. The circuit, complete with buffer stages and low pass filter, is probably more elaborate than we need, and I would envisage introducing a simpler circuit later on to do the job. In the meantime, the VFO has provided a stable frequency output at a level of around five volts peak to peak, and has done its job to verify the merits of the system.

Circuit Simplification

At this stage I see some scope for simplification of both the mixer and the VFO circuitry. An attractive option is to make use of balanced mixer type NE602, which has appeared in receiver circuits published in overseas journals. The NE602 appears to do the same job as the well known balanced mixer type MC1496, but does so without all the external resistors required to make the latter work. Furthermore, it has an inbuilt oscillator circuit which can be made to operate by the addition of an external tuned circuit or crystal.

Operation

In setting up the receiver, it is first tuned as close as possible to 1.5 MHz as indicated by the receiver calibration. A distant non-directional beacon (NDB) is tuned in by the converter and the receiver is then finely tuned for maximum signal, preferably indicated on an S meter, if fitted. The signal can be located with the crystal filter set for wideband, but it is important that final adjustment be made with minimum bandwidth.

Tuning of the loop antenna is fairly sharp and must be set for maximum signal. Manual adjustment of tracking between the loop tuning and the VFO tuning is simplified if both tuning dials are calibrated. Some misleading

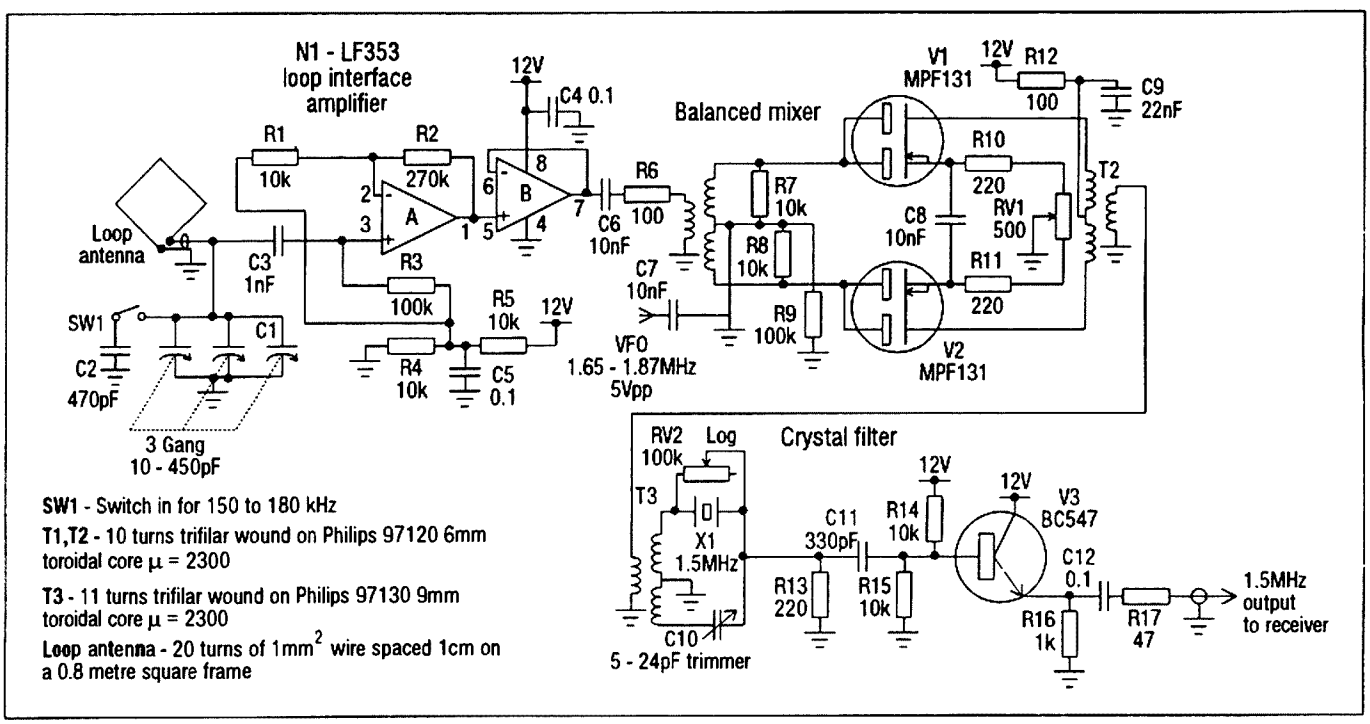


Figure 3 — Bandwidth limiting LF converter, 150-370 kHz.

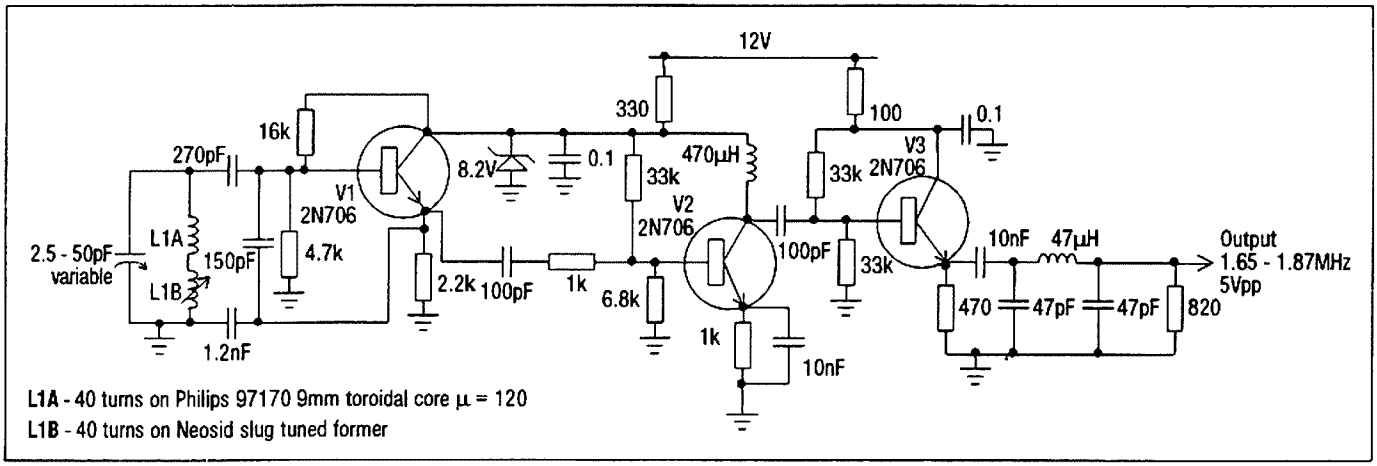


Figure 4 — The VFO is somewhat elaborate and a simpler arrangement is envisaged.

cross-modulation effects can occur if the loop is wrongly peaked to the frequency of a strong local NDB station. A distant signal can also be missed if the signal direction happens to fall within the loop null. In searching for signals, rotation of the loop is part of the tuning ritual.

The multitude of NDB stations above 200 kHz with MCW keyed ident codes provides plenty of test signals for checking out the performance of the converter/receiver rig.

Conclusion

I am satisfied that the converter system works very well for frequencies in the LF range. It incorporates the tuned loop antenna and can limit the bandwidth for narrow bandwidth mode of signals. With the receiver and converter circuits all correctly tuned, I did not notice any undesirable heterodyne beats or cross-modulation effects.

The test rig was made up using a balanced mixer and VFO recovered from a different project. Whilst these worked extremely well to prove the system, some further effort is envisaged to reduce the component count and simplify the whole LF converter. I will pursue the option of using the NE602 balanced mixer later on.

References

1. Lloyd Butler VK5BR — VLF-LF and the Loop Aerial — Amateur Radio, August 1990.
2. John Adcock VK3ACA — The day we crossed the Tasman on Long Wave — Amateur Radio, April 1993.

18 Ottawa Avenue, Panorama, SA 5401

ar

WIA News

Coast Guard ends Morse Code

The United States Coast Guard has closed down its Morse Code operations on 500 kHz. The final CW transmission ended an era at 0000 UT on 31 July 1993, according to the *W5YI Report.*

Coast Guard operators first began listening for distress signals on 500 kHz at the turn of the century. The Service set up its permanent station almost 70 years ago, to monitor 500 kHz on a continuous basis.

Officials said the advent of satellite communications and digital technology had made Morse obsolete on the high seas.

A misty-eyed Coast Guard radio man tapped out the final 73, saying *"we now look forward to serving you on the next generation of communications equipment and systems via the Global Marine Distress and Safety System (GMDSS)."*

1994 Callbook

The 1994 Callbook was published in October, produced by the WIA Federal Office under direction of Production Editor, Bill Roper VK3BR. Supplies have been despatched to all Divisions, so inquire from them if you wish to order a copy for yourself or copies for your club.

Getting a Multiband HF Vertical to "GO"! (Part 1)

David "Doc" Wescombe-Down VK4CMY/VK5HP describes his experience with a useful vertical antenna*

Vertical aerials are conventionally mounted perpendicular to the surface on which they are erected and often appear mounted on the ground, vehicle or boat surfaces or above ground on a mast or tower. In describing one of the latter variety for interested parties, it would be opportune to consider six FALLACIES surrounding these RF radiators.

FALLACY ONE — vertical aerials are space saving and ideal for small suburban lots. Yes, that is what the manufacturers would have us believe, but NOTHING COULD BE FURTHER FROM THE TRUTH! Verticals of proper proportion take up much more space than dipoles, G5RV, Zepps, beams or quads. A good ground system for a short vertical (less than 7/16 wavelengths long) takes much more space than a dipole unless installed over salt water.

All the literature confirms that the quality of the reflecting ground system (up to 1/2 wavelength from the aerial base) is important for aerial efficiency. Radials serve to collect return currents from the vertical radiators. The Brewster angle will be affected by the ground quality for more than 1/2 wavelength from the base of the radiator (assuming ground mounting). A good ground for a long distance from the aerial will facilitate a low Brewster angle which will result in a lower wave angle with respect to the horizon. Ground conductivity as far out as 100 wavelengths in the target direction will affect radiation angle.

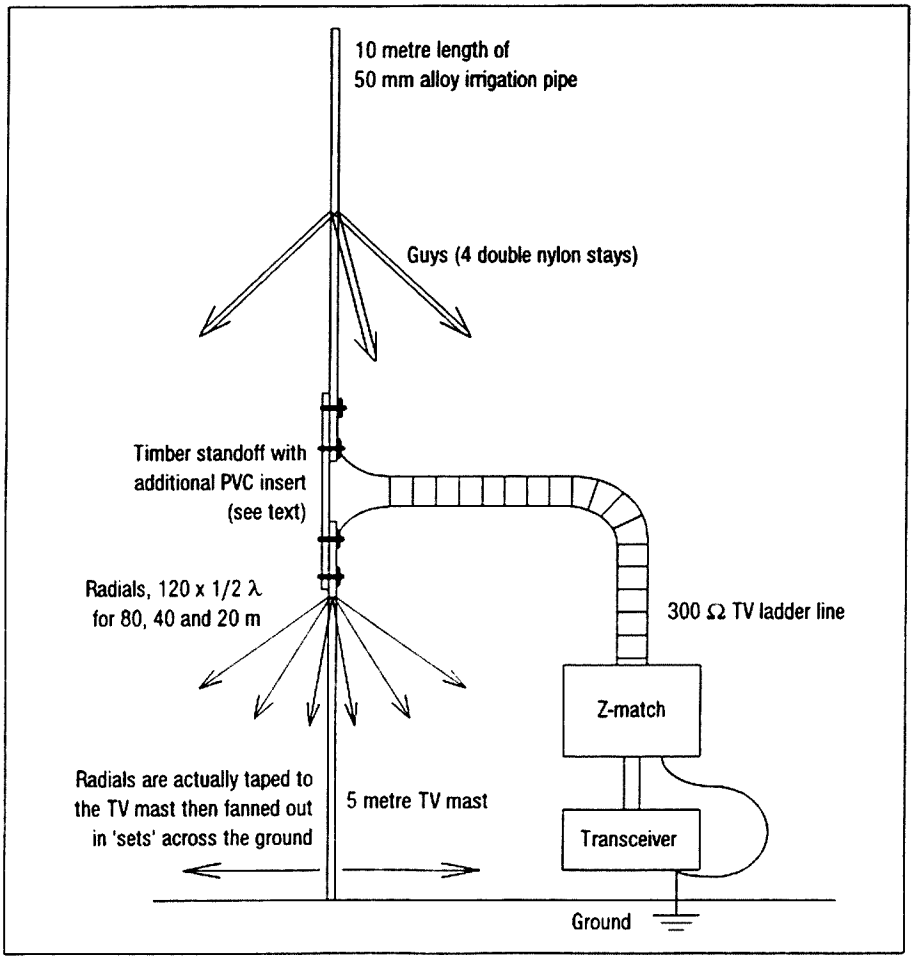


Fig 1 A versatile, multi-band vertical antenna.

FALLACY TWO — manufacturer's instructions would have us believe four radials per band are optimum. Adding radials from this basic four to ninety six will improve a signal by 3.9 dB over poor ground, 3 dB over average ground and about 1 dB over salt water (which is already an excellent ground to have). Many long radials will improve the radiated wave angle and Devoldere ON4UN (1987) states that a lowering of up to 10 degrees can be achieved with 120 radials each 0.5 to 0.6 wavelength long.

Installing strips of chicken wire in different directions on top of the ground also helps reduce ground losses, as will a 3 m^2 metal plate (aluminium, brass or copper) beneath the aerial base.

FALLACY THREE — the diameter of radial wires is not important.

With a small number of wires (eg 8 per band) the heavier the gauge used, the better. If many wires are used, the return current is able to be spread over many more paths and so wire gauge becomes less important. The author uses 7 strand bare copper for the 80 m radials and heavy gauge insulated stranded copper wire for the 40 m and 20 m radials wherever possible. Due to the amount of wire required, it became necessary to use recycled auto electrical winding wire, relying on the enamel insulation integrity.

FALLACY FOUR — ground rods are desirable at the aerial base and at the end of each radial.

Ground rods are necessary for a good DC ground but are almost non-contributory as RF grounds. They would, however, constitute a minimum RF ground zone for terminating certain types of wire receiving aerials (eg Beverage) or when highly conductive soil exists.

FALLACY FIVE — burying the radials is preferable.

In fact research has shown that ELEVATED radial wires make a better ground system than buried wires. This is because the return currents do not have to negotiate the higher resistance soil if the wires are elevated. Next best is to use INSULATED radials on the ground surface. If they MUST be buried, then try to locate them in the top 50 mm (2") of soil.

How many radials to use? Ensure that the tips of adjacent radials (for the same band, of course) are separated by a distance no greater than half the height of the radial system above the ground.

FALLACY SIX — burying chicken wire or fencing wire mesh offcuts assists the ground system.

Any ferrous material, even if galvanised, will last only a very short time in the ground. Corrosion acts very quickly. In any case steel is not a good RF conductor.

WHAT ELSE?

INSTALLING A RADIAL SYSTEM AT GROUND LEVEL — cut any grass or meadow hay really short at the end of the growing season in your area, then lay the radials flat on the ground, anchored as appropriate with small tent pegs. By next growing season the grass should have completely covered the wires and normal traffic and/or mowing operations will be possible.

A MULTIBAND VERTICAL — the author has been using QRP (1 to 30 watts input) to a versatile yet economical vertical aerial on 80, 40, 20 and 15 metres as shown in Fig 1.

The radiator, 1/4 wave on 40 m, had 20 radials per band initially and has consistently succeeded in DX pileups on 40 and 20 metres in spite of the low power applied. Usually only monoband directive arrays and/or amplifiers beat the vertical on air. This antenna, now re-located to a new QTH over 900 metres above sea level, is the same basic construction, but with much more real estate available (10.5 hectares) has 120 1/2 wave radials per band. These are "piggybacked" in sets of 3 (80, 40 and 20 m) one for each band and taped together to act as a counterpoise network rather than a "solder-everything-together ground mat". All wires are insulated from each other. Fed with 300 ohm open ladder line, the system is resonated by a Z-match for the desired band of operation. The aerial tunes easily on each band and results have been most gratifying. Since 50 mm diameter alloy irrigation pipe is used as the radiator, bandwidth is excellent and the system tunes across all the allowable spectrum in each case.

"The radiator . . . has consistently succeeded in DX pileups on 40 and 20 metres in spite of the low power . . .

The radials are brought down the TV mast support (taped to it) to ground level, then fanned out in "sets" across the ground surface.

A halved section of 50 mm external environment PVC piping 30 cm long is used as an additional insulator between the radiator and the mounting board. Radial wires in this case are a mixture of 7 strand copper aerial wire, bits and pieces of plastic insulated wire, and a large quantity of discarded windings bought from an electric motor rewinder for $10 — these are all enamel insulated.

By the time this makes print a full-size 1/4 wave 80 m ground plane will be similarly installed (similar feed, similar construction).

The author sincerely thanks those who have provided "on-air" evaluation assistance both locally and overseas, especially VK5AAQ, ZL4QY, VK2DBI, VK2GRN, ZL1BKI, VK6VC, VK6PJ, W6PM, SP9FF, and K72X/MM. Additional discussion is welcomed (via PO DALVEEN QLD 4374) and for the follow-up reading try:

"Low Band DXing" by John Devoldere ON4UN (ARRL)
"Novice Antenna Notebook" by Doug De Maw W1FB (ARRL)
"W1FB's Antenna Notebook" by Doug de Maw W1FB (ARRL)

*PhD Grad Dip Ed
RNARS 1464,
QRP 221 C/o Post Office Dalveen QLD 4374*

ar

Latest on New Amateur Licence Conditions

The following letter was received by fax at the WIA just as this issue of Amateur Radio was being put together.

Spectrum Management Agency
R91/65
9th November 1993
Mr Bruce Thorne
Federal Secretary
Wireless Institute of Australia
PO Box 300
South Caulfield
VIC 3162
Dear Mr Thorne,

Thank you for the Wireless Institute of Australia's recent request for advice on the current status of the proposed amendments to the conditions applicable to the Amateur Service. The Spectrum Management Agency (SMA) is conscious of the interest of the Amateur community in the new arrangements and we are also keen for them to be put into effect.

As you aware, the proposed changes included a general simplification and reduction in the number of licence conditions and the introduction of an additional class of licence. As advised in Gwen Andrew's letter of 1 February 1993 to your predecessor Mr Roper, it was anticipated that these changes would have been implemented on 1 July 1993.

Unfortunately, the changes necessary for the introduction of the proposed Amateur arrangements were not able to be included in the package of subordinate regulations and instruments involved in the introduction of the Radiocommunications Act on 1 July 1993 and the establishment of the SMA.

With the new legislation and the SMA successfully established, outstanding matters, such as the revision of the Amateur operating arrangements, can now be finalised. The next opportunity to make the legislative changes necessary to implement the new Amateur arrangements will occur in the autumn sittings of Parliament next year.

As soon as final details of the proposed legislative changes are known, the SMA will make them available for publishing.

Yours sincerely,

Geoff Hutchins
A/g Executive Manager
Business directions Group
ar

Field Day Preparation

Chris Davis VK1DO discusses all the factors involved in successful field day preparation*

The keen field day operators who have made enormous efforts over the last few years have been justifiably disappointed with the level of operation elsewhere in terms of other similarly equipped VK field stations. The lack of participation on the local VK front has led many stations to make significant efforts to equip their stations to gain the majority of their points from overseas stations on 14 MHz etc. The current sunspot cycle will make 14, and certainly higher, pretty poor picking during the '94 John Moyle field day contest.

Some of this advice might seem to you like teaching old dogs new tricks or teaching your grandparents to suck eggs. I am fairly convinced that many people have such a lack of experience in camping and portable work generally that a little general advice could be invaluable to many operators and hopefully inspire them to feel confident to make plans and participate. It is no longer reasonable to presume that Australians are naturally skilled in bushcraft and safety; twenty years ago I met people who had never looked at the stars let alone slept outdoors. I can't imagine that this trend would have improved. If you do feel I am preaching to the converted then I look forward to hearing your field station during the contest!

This is an ideal time to drum up more interest in this exciting and satisfying facet of our challenging hobby. Field days call upon your energy, your initiative, your team work skills, your organisational skills, your operating skills and your ability to want to have a go!

In some amateur communities there is a tendency to simply philosophise about field days and dream along in a state of suspended imagination until a few weeks before the March weekend in question. Suddenly, without apparent warning, the event has sneaked up on you and it is impossible to alter social appointments, organise gear, etc! The following suggestions could form the positive framework for a first foray into the field or a reminder list for more experienced teams.

"Field days call upon your . . . ability to want to have a go!"

A brief summary of the aims of a field day contest weekend is:- Single operators or groups required to emulate the conditions that apply in the event of an emergency (ie portable power supply, no more than twenty four hours preparation on site prior to the start of the contest). The rest of the more specific description is contained within the rules which are published prior to the March contest each year. Please read them!

Your choice of site might be influenced by its outlook for VHF, its abundance of trees for HF antennas, or perhaps a prominent fire tower to aid in raising antennas, etc.

Sites

Choosing a site for use in March of each year often has the added complication of total fire bans which could prevent your access to certain hilltops. Some sites require permits and are best obtained long before the day. Arriving to find your dream hilltop barricaded by a locked gate or duty fire officers is a very disappointing start to the weekend, particularly if other options are dramatically inferior or distant. Understandably, these personnel, who are often volunteers, have strict instructions as to who can do what in the forests and national parks. It doesn't matter how well intentioned you are, if no prior arrangement has been made you will be all dressed up with nowhere to go.

Approval to operate within forests and local national parks might be given with certain caveats such as independent toilet facilities, no fires, removal of rubbish, no deforestation, some fire fighting gear etc, etc. Some of these caveats might be contingent upon the size of the group. Estimating the total number of people who are attending a site over the twenty four or thirty six hour period might create the impression of such a crowd that you will be hard put to comply with all requirements or convince anyone to issue a permit at all.

Count the number of key people who will be on site, eating and sleeping. If the operation needs to be scaled down in line with specific guide-lines, don't delete the site, contemplate how you can best

WIA News

Lunar Repeater

The Project OSCAR Group of Northern California has proposed installing the first amateur repeater on the moon. Project OSCAR is the group that built and orbited the world's first amateur radio satellite.

During recent meetings, says the *US Westlink Report* (No 655), the organisation decided to revive "Project Moonray" to take amateur radio into the 21st century.

Moonray is short for Moon Relay — a concept first proposed by W6OLO back in 1965. The idea was to build a repeater that would fit under the seat of the Lunar Rover. But, the project was shelved after the US Congress cut funding for manned Moon missions beyond Apollo 17.

No specific schedule for establishing Moonray has been offered by the Group, although organisers hope to get the project off the ground by the turn of the century — only seven years and one month away (to 2001).

comply by pooling vehicles and equipment so that you are compact and efficient.

Clothes

A few general areas to bear in mind. Firstly your clothing etc. Clothing ranging from shorts, tee shirts through to long shirts, tracksuits, jumpers and rain coats are vital as often the sites we tend to select for field events are hot and dry by day and surprisingly, if not distressingly, cold at night. Sunburn protection is vital if you are to be of any help after the site is established. Sun-glasses, hats, insect repellent and fly killer to eradicate that horse fly that decides to invade your tent. At least one well equipped first aid kit for the group, preferably with at least two members versed in how to use its contents. I say at least one as it is often the case that the vehicle containing the kit might have gone back to town on an errand just when the kit is required.

Not only is wet weather clothing desirable, but a change of clothes in the event of a drenching will make you feel more able to persevere in the event of cold wet conditions. On the whole, you can't take too much clothing in the form of refreshing changes of shirts, underwear, and socks with an extra pair of shoes. No thongs and no sandals, being serious about sunburn protection and fly and insect repellent isn't being weak or wimpy, just practical.

Food and Drink

On the food side. Try not to change your diet dramatically from what you know you are able to eat. Some canned foods, most mince meat, and some chocolate is excessively full of preservatives, MSG, or caffeine such that the dramatic change might bring on migraines, upset tummies or worse. Fruit is an excellent form of slow release energy which, combined with sandwiches and plenty of fresh water, will keep your blood sugar levels steady and enhance your capacity to get to sleep and survive on less than usual sleep. Large cooked meals take a lot of time, usually aren't digested adequately, and place greater demands on resources.

Generally you will find cola or other high caffeine drinks are poor refreshers and are excellent recipes for sun stroke as they provide easily broken down sugar forms which alter the blood sugar level with rapidly oscillating excursions. Incidentally, cola drinks are not the only soft drinks high in caffeine. Some lemon drinks produce the adrenalin rush they are so proud of by emulating ten cups of coffee in one can! Fruit juice, or even plain water, is the best replacement for the water the body loses when faced with long term exertion in hot dry conditions. It should be combined with complex carbohydrates like bread.

"Being serious about sunburn protection and fly and insect repellent isn't being weak or wimpy, just practical."

Transport

What about the dreaded motor car? Have you done anything to your car which vaguely emulates servicing of late? Spare tyres, tyre changing gear, inflation levels of all five tyres, oil levels, water levels, radiator condition to cope with the possibility of an extended slow, grinding climb perhaps towing a trailer in warm conditions. Condition of fan belts, water pumps, radiators and so on are worth investigating prior to a problem particularly if a breakdown represents the blocking of a single lane mountain trail.

What do you need to operate your radios comfortably in terms of furniture and accommodation? Collapsible compact tents which have had their assembly rehearsed and have known waterproofing performance are often a safer bet than the cumbersome but luxurious features of a caravan. Towing a van suits the experienced but is dubious, if not plain dangerous, for someone attempting their first excursion on uncharted roads. Caravans can often represent more trouble than they are worth particularly with rough terrain and poor access roads to many sites.

Furniture

Collapsible tables, chairs, and ground sheets will usually allow the establishment of a comfortable operating position which remains dust and water proof with some rehearsal before the event. Tents often seem bigger than they actually are until you lay out a couple of square metres of operating space, enough to accommodate the radios, log sheets etc. Lamps for night use require numerous spare globes wrapped in shock resistant cardboard. Yellow light often lights adequately and is less attractive to mosquitoes. Fluorescent lamps, while effective, are RF noisy and more fragile than would first seem. You are easily able to keep half a dozen spare forty watt incandescent globes on hand, however, spare 15 watt fluoro tubes are less likely. Being able to hang a bayonet fitting, with some sort of casing like a car light, from the roof of the tent proves an effective and portable lighting system. Gas lamps, while bright, are fragile, expensive, noisy and hard to install reliably.

Keeping a battery torch handy will help you to stumble out to the generator when the juice runs low.

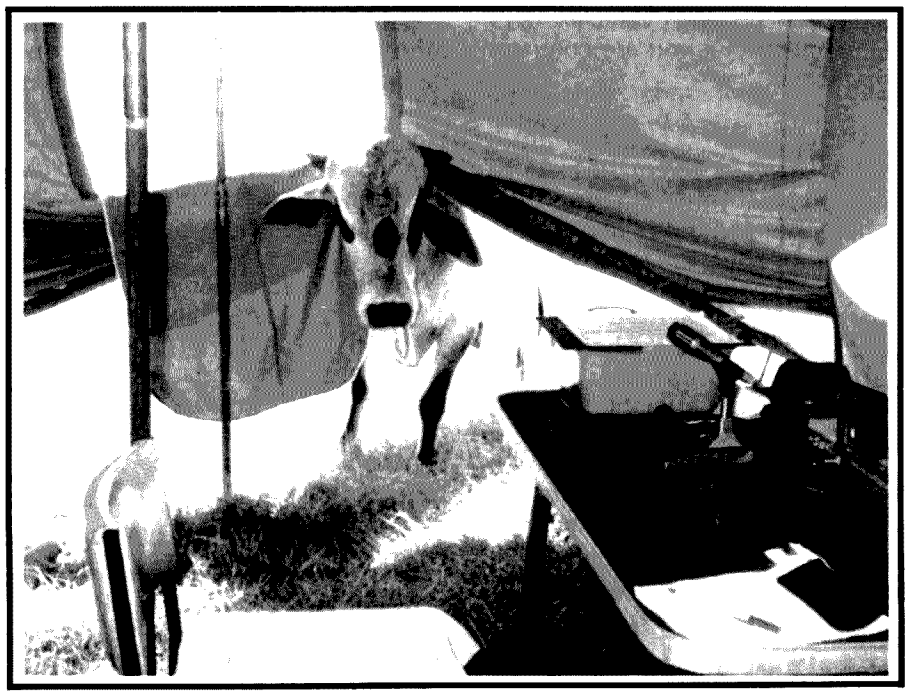
If you think you can survive without an air bed, don't count on a great deal of sleep. The hilltops are notoriously rocky and uncooperative in accommodating your bony frame. An airbed and a sleeping bag, even in relatively summery conditions, are vital. Even if the airbed leaks during the night, you can be lulled into the arms of Morpheus unaware that you will wake on rocky terra firma.

Power, Tools and Antennas

So you have got there, tents are up, tables, chairs, sleeping arrangements and food storage and preparation are all okay. What about the radios? The radio gear needs a thorough checklist of its own. Have you left the detachable power cord at home? What about a microphone, accessory plug which disables some radios, patch cable to convert your BNC, SO239 or RCA sockets to connect to the field antennas, extension leads (preferably heavy builder's cable if the runs exceed ten metres), power boards with adequate outlets (bearing in mind the extra space that adaptors straddling two sockets often use up), enough outlets for radios, power supplies, rotators, lamps, perhaps a soldering iron, and so on?

Check what the ratings and sizes of your radios' various fuses are. Fuses are often rated close to the operating margin and fail when the gear gets an unusual source of mains power or the surges of a spluttering generator. Many radios have a mains fuse on the back panel and possibly another half a dozen low voltage fuses inside on the power supply board. The manual might help. If not, buy yourself a kit of three or four different fuse shapes and sizes and a couple of each amperage, 500 mA, 1 A, 2 A, 5 A, 10 A, etc. A useful kit to include in your tool box as a day to day item anyway.

Apart from the range of antennas, feedlines, etc that your group divvies up responsibility for amongst the team, each person needs a minimum basic tool box of screwdrivers, spanner, pliers, side cutters, knives, soldering gear and a multimeter. The old forty watt toy iron is okay if you can be patient. However, someone on the team needs a big iron like a Scope to cope with the loss of heat outdoors and the massive heat required on antennas and connectors at times.



Larger creatures than mosquitoes may also disturb a Field Day! Mark VK4KEY was participating in the 1991 John Moyle Field Day with the City of Brisbane station VK4WIE when the young Brahman bull appeared, at Mt Wolvi near Gympie. VK4WIE went on to win the multi-operator 24 hour HF phone section, apparently doing better without the bull!

Specific attention to antennas is probably a matter of personal choice. However, a general recommendation is to take nothing on field day that hasn't been tested or is at least identical to something you have had first hand experience with. If you aren't certain about your rusty vertical or your bent, tired beam, leave it at home, make up a dipole and erect it at home beforehand. Check that it generally works with the feedline you intend to use on the day with sufficient built-in margin to shorten or lengthen the affair if the on site performance is radically different from your dress rehearsal. An antenna tuning unit will accommodate all but the most dramatically faulty antennas and aid the prevention of interference between the different bands which must allow simultaneous operation.

The generators you beg, borrow or hire can take two forms. A couple of relatively big ones, like 5 kVA each or one enormous 15 kVA. The disadvantage with the enormous one is, if it stops, you are completely stopped. Also, it is usually an expensive brute on fuel and towing difficulty. Two or three 3.5 or 5 kVA machines will run efficiently and, in the event of mechanical breakdown, the whole station could probably survive on just one. Baby 900 watt lightweight generators will power only the lowest power station or one supported by 12 volt batteries being floated. A standard 100 watt HF radio will not quite run on a 900 watt generator let alone extra lights or other rigs. If you don't believe me, read the label on the back and then bear in mind that many of the ratings for portable lightweight generators are specified for 60 cycles lighting mode where voltage regulation and so on isn't important.

Final Arrangements

Perhaps we have covered sufficient points in terms of practical detail. A few points in conclusion. Keep logs in the mode that the contest requests (ie UTC or local, normally UTC), remind each operator to wear their

watch and clarify that they know how to convert to UTC, have adequate pens (pencils are not okay for logs), prepared log sheets that have just the detail required for that contest, and a clip board to prevent the wind removing your hard earned contacts. An acquaintance with the rules is preferable before the contest. Nothing is more annoying than the clown who claims he can't work you or vice versa holding up the proceedings when they haven't read the rules.

Don't underestimate travelling time to your chosen site. Visit the site beforehand. Time and note the duration of the trip and then add the possible delays likely to be encountered while towing or heavily laden.

Aim to arrive in comfortable time to erect tents, put antennas in operating positions, etc, and ideally have time to have a relaxed lunch prior to the contest starting. To give you an idea, setting out around 7 am is not too early to take in only an hour's travel, set up, and start at 2.00 pm. Some people like to dawdle out to field days. However, they are often then trying to work in the heat of the day without time up their sleeve. Agree on when the team will travel, breakdowns or directions are then easily catered for and the team work can begin together without rushing.

Above all, field days improve your capacity to improvise and adapt but being prepared makes for more fun and a tendency to look forward to doing it again. Will you give it a try? If it's your first effort, organise a small team of people you know you will enjoy being with and do a good job on a small scale. Each exercise that you complete with satisfaction and pride will enhance your interest in going out again on a larger, more ambitious scale. Good luck and see you in the '94 John Moyle Field Day Contest.

123 Hawkesbury Cr Farrer ACT 2607

ar

WIA News

The Exam Service

There are now more than 500 accredited examiners around Australia (as at 30 September 1993); some 63% are WIA members.

Since the WIA accepted responsibility for amateur radio examinations in 1991, 4063 candidates have sat for examinations under the WIA Exam Service.

During November, the Spectrum Management Agency conducted an audit of the Exam Service. A report on the SMA's findings will be ultimately received, so we'll bring news of that to you in a future WIA News.

RANDOM RADIATORS

with Ron Fisher VK3OM and Ron Cook VK3AFW.

Balcony Antennas

Some little while ago Gerry VK2BMZ forwarded a book published by the JA CQ Ham Radio group. He suggested that the title was "Verandah Antennas", but the more appropriate title seems to be "Balcony Antennas", as there are very few verandahs and a great many balconies in Japan.

The Japanese are determined and resourceful so living in a small flat many floors above ground is no impediment to enjoying amateur radio. Australians are well known for ingenious repairs using scrap wire etc, so while some of the Japanese ideas might be adopted directly, we have no doubt that they will at the least be a source of inspiration for specific solutions to limited space antennas.

One of the striking features of the book is the large number of advertisements for useful antennas and accessories for apartment dwellers. There is a variety of standoffs, small units to mount on the balcony rail and fitted with a stub mast for mounting antennas. There are larger steel structures designed to mount on the wall and extend beyond the balcony. Some of the mounts are really short tower sections and most will take a rotator. There is also an array of clamps, telescopic tubing and adaptors.

Also there is a range of roof mounting hardware ranging from simple clamps, guys and small towers. Of course there is a very extensive range of antennas, ranging from single and multiband verticals to multiband yagis for frequencies ranging from 1.8 to 1300 MHz.

"When not in use the antenna is swung against the side of the building . . ."

A company called Delica advertises a self-contained rf bridge with digital frequency display and capable of operating from 1.5 to 150 MHz. A smaller bridge is available for connecting to an external oscillator and digital dip meters are available for operation from 0.1 to 470 MHz. That's enough of the adverts. We will bring you some of the ingenious antennas described in this book over the succeeding issues.

Multiband Balcony HF Antenna (Figs 1 to 5)

One of the simplest HF antennas described is a horizontal 5 m aluminium rod. This is one of several antennas described by JI1XPB. It consists of two telescoping sections mounted to but insulated from a short vertical mast. A length of cord runs from the top of the mast to the end of the thickest section of the rod, thereby reducing sag and minimising the load on the end support. An ATU is used in conjunction with a short connecting wire to resonate and match the monopole. The mast, balcony and water pipes should be connected to form the earth, or loaded radials could be used.

When not in use the antenna is swung against the side of the building, thus minimising its visual impact. In many Asian countries it is customary to hang washing on poles protruding from balconies, so this antenna could have a dual purpose and be an effective "invisible" antenna. The VSWR can be kept below 1.5:1 on 7, 14, 21 MHz and less than 2:1 on 28 and 3.5 MHz, although the bandwidth is limited on the latter band.

The antenna is an end fed half wave on 28 MHz and this is the only band on which a good ground would not be essential. It is a 3/8 th wave on 21 MHz and a quarter wave on 14 MHz. On 7 and 3.5 MHz the ATU provides end inductive loading. It should work satisfactorily on the "WARC" bands.

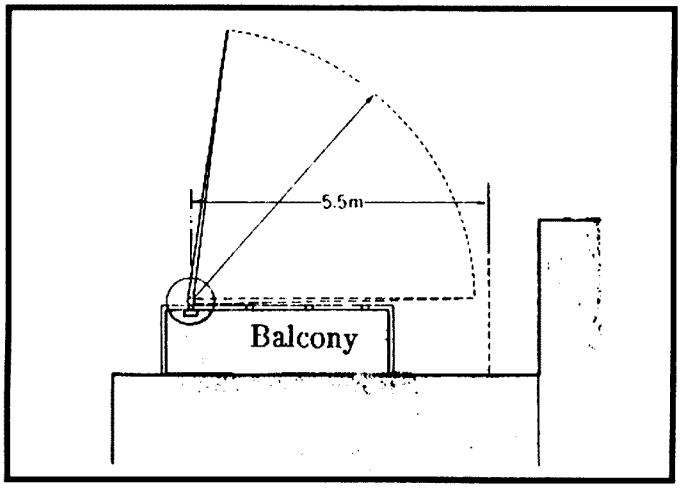


Fig. 1 Plan view of antenna mounted on balcony with rotator.

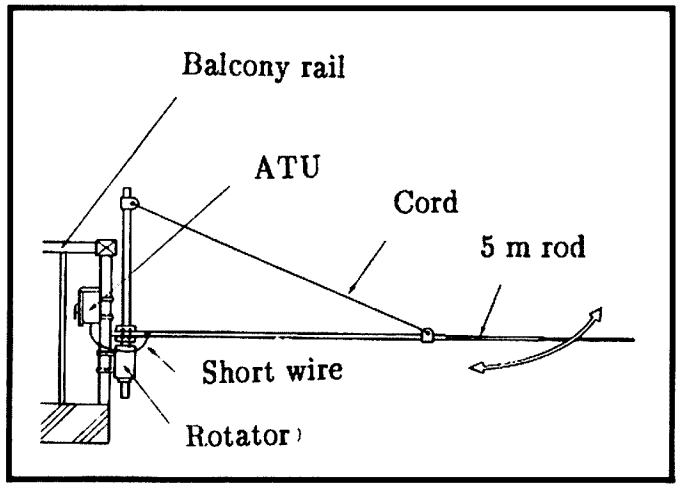


Fig. 2 Elevation of rod antenna on balcony.

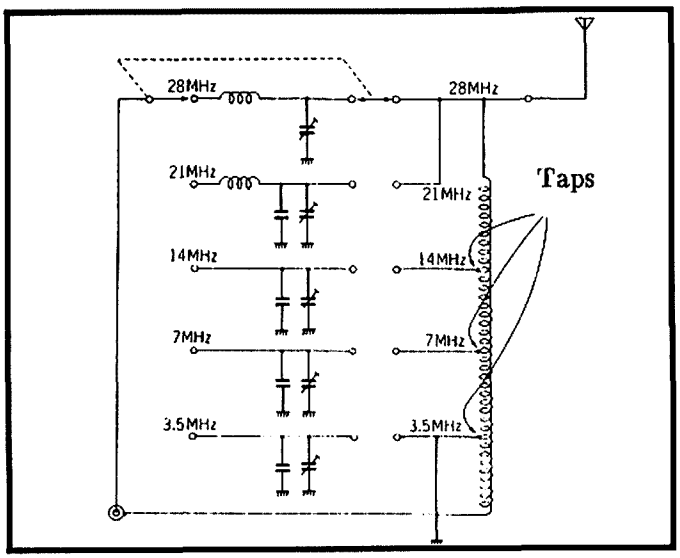


Fig. 3 ATU circuit

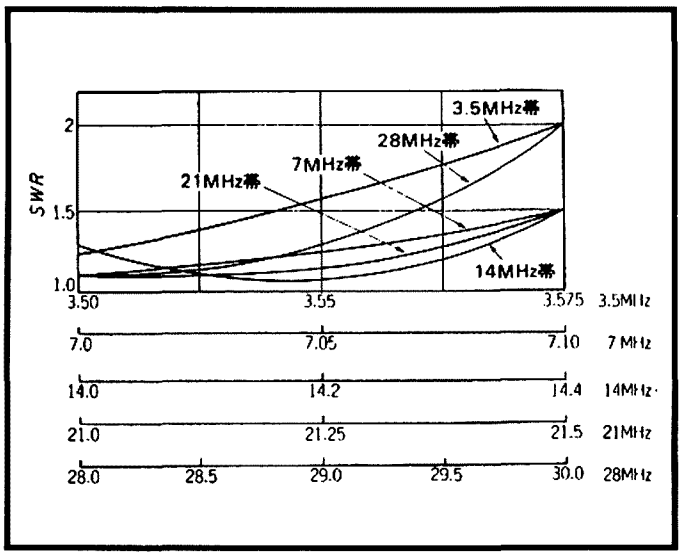


Fig. 5 SWR with ATU pretuned.

Unfortunately, although the schematics are clear enough, no mention of actual values of the components is given, or at least not in a form comprehensible to either Ron. Still it is worth trying as a useful HF antenna for restricted space, and if you prefer you could hang a flag on it instead of your washing.

The book gives some graphic warnings about working on antennas on balconies. The number one rule is tie one end of a cord onto every tool and part and tie the other end onto a fixture so that when something is dropped (not if) it will not injure anyone or anything below on impact.

The old J Pole

For 2 m operators the old J pole (no Paul not the J curve!) is a good standby. JH5MNL describes this and several other vertical configurations. Figs 6, 7 & 8 show several different configurations, the difference being due to differing velocity factors of the cable used.

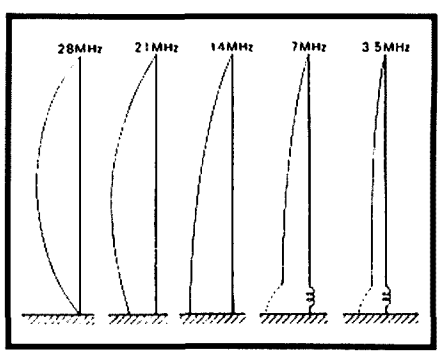


Fig. 4 Current distribution on rod.

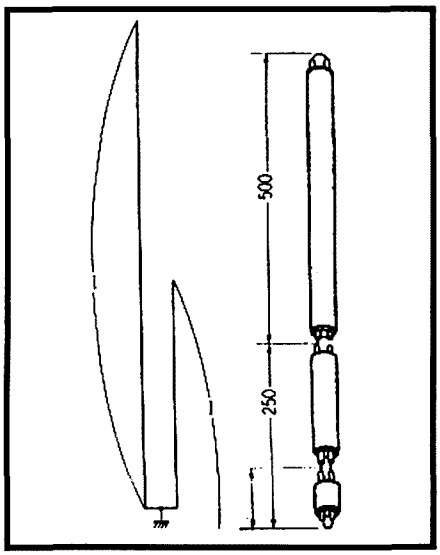


Fig. 6 2 m J-pole nominal sizes

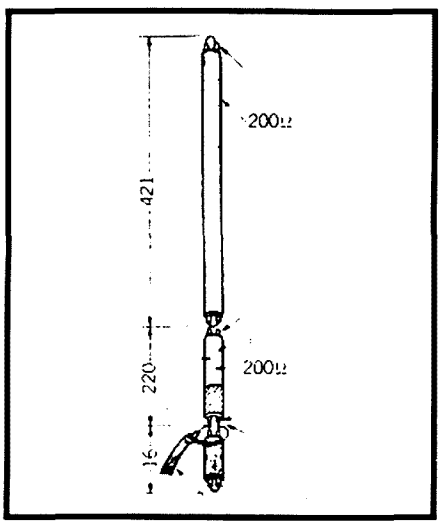


Fig. 7 2 m J-pola.
Dimensions for 200 ohm twin feedline with velocity factor of 0.8. Coaxial 50 ohm feedline is tapped 16 mm from bottom.

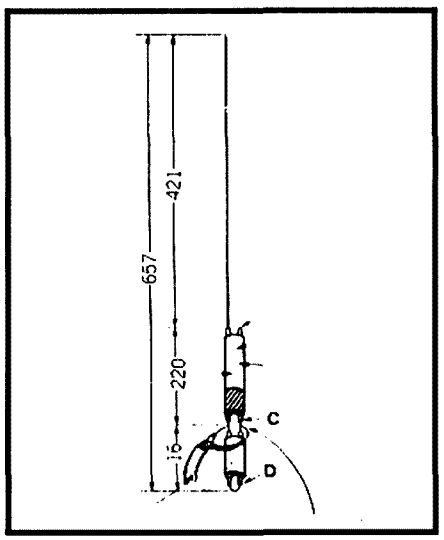


Fig. 8 2m J-pole.
Top section replaced with a whip. It may be best to start with it at around 525 mm and prune it back to get the best SWR.

For mounting on a pipe the J pole should be enclosed in a length of plastic conduit. A short length of plastic cord can be used to keep the antenna straight.

Loaded Whips give 4 Bands (Figs 9 & 10)

The reader may be aware of the old "pitchfork" arrangement whereby three loading coils and associated resonating whips are fitted on an adaptor screwed to the top of a 1.5 m whip. Fig 9 shows an alternative arrangement where two whips are screwed into a metal ring fitted over an insulating rod. The rod is clamped to the top of the balcony handrail. The

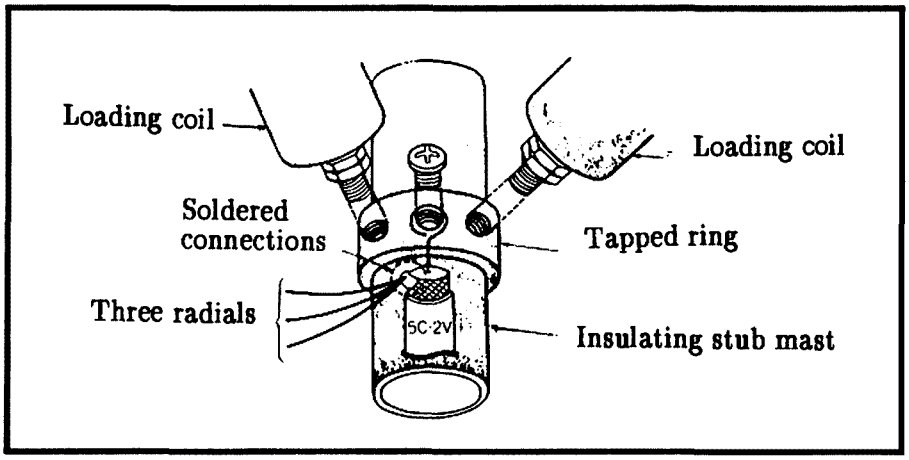


Fig. 9 Base of multi-whip antenna.

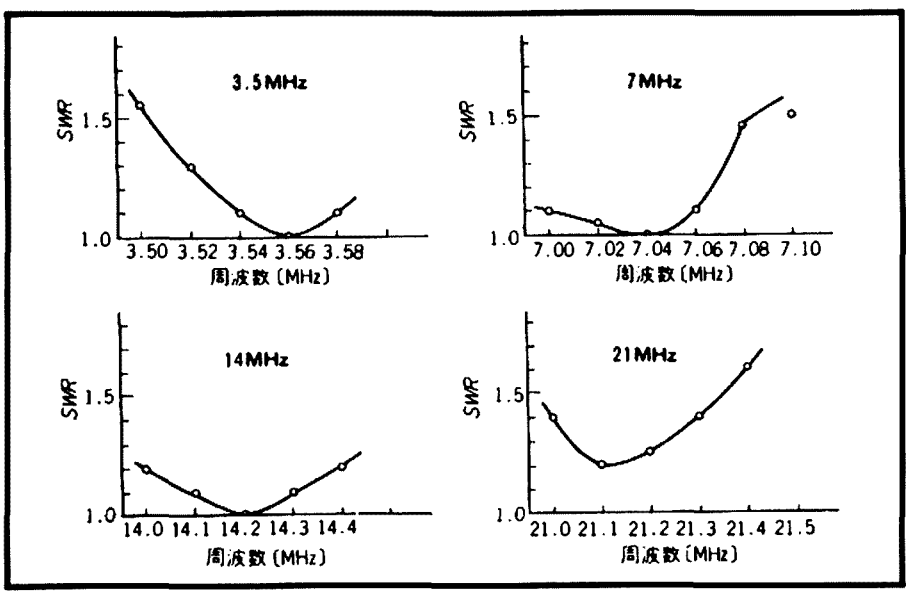


Fig. 10 SWR curves for 4 whip antenna.

centre conductor of the coax feedline connects to the ring and three radials are connected to the screen. They measure 22, 5.4 and 3.4 m for 3.5, 7, 14 and 21 MHz.

The whips shown in the article are base loaded and only two are fitted at any one time. Light weight helically wound whips should be an effective alternative. The SWR attained is less than 1.5:1 on all bands although the bandwidth is only about 100 kHz on both 3.5 and 7 MHz. This arrangement is one attributed to JH2UNG.

Bent Dipole for 40 m (Figs 11 to 13)

Another interesting contribution from JH2UNG for those with a large flat or apartment on the corner with an L shaped balcony is a dipole on 40 m. A short 2 m mast holds the feed point above the balcony rail and is placed at the corner of the balcony. For resonance a length of 10.6 m is required for each leg of the dipole but this is likely to be too long for even the largest corner apartment. The ends are therefore bent down. The arrangement shown in the sketch allows tying the ends with a plastic cord and avoids the need for heavy ceramic insulators. To assist with obtaining a good match, a 3 m long inductive stub is connected at the feed point. The 1.5:1 SWR bandwidth is about 50 kHz.

Tuneable Loaded Dipole for 7-29 MHz (Figs 14 & 15)

One of the more complex antennas in the book is described by JG1KHK. It is a dipole with variable inductances at the centre of each dipole. It appears that each dipole is 2.5 m long. The coils are mounted on a common former with a gear in the centre. A small motor drives this gear, thus rotating the coils. Spring contacts are used to make contact with the coil and rings at the ends of each coil. As the coils rotate it appears the two contacts progressively short out more or less turns, thus resonating the antenna. The coils are 32 mm in diameter and

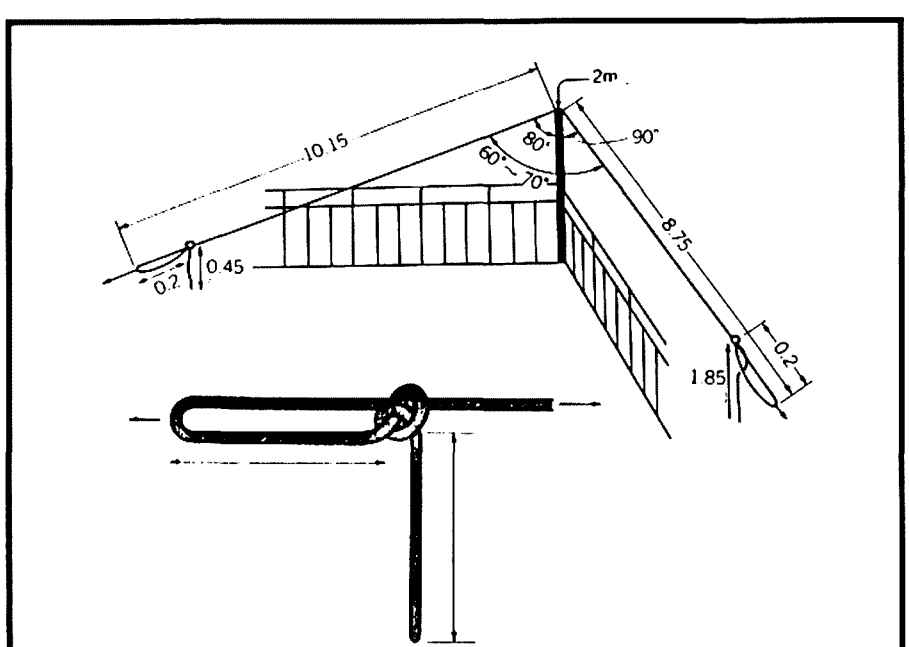


Fig. 11 General arrangement of dipole. Note arrangement for adjusting ends for resonance.

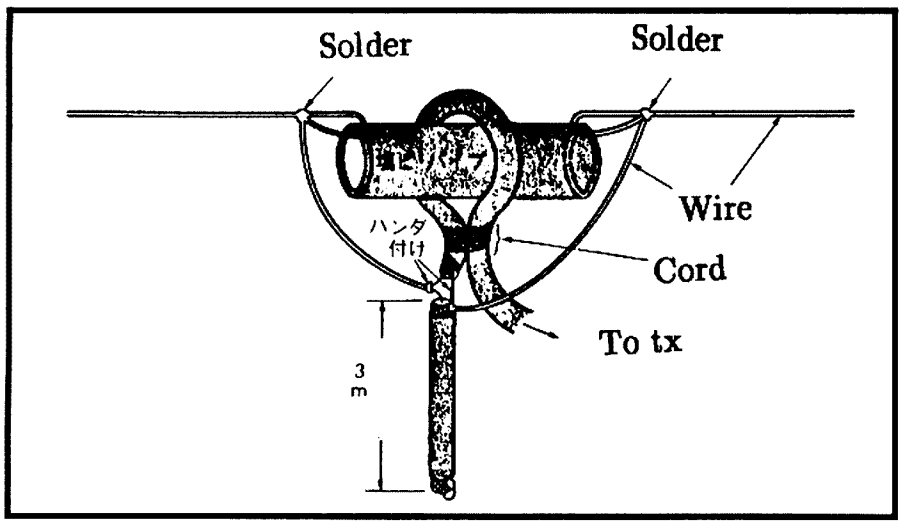


Fig. 12 Feedpoint arrangements. Note use of pvc tube as centre insulator and matching stub. Seal all open connections of coax.

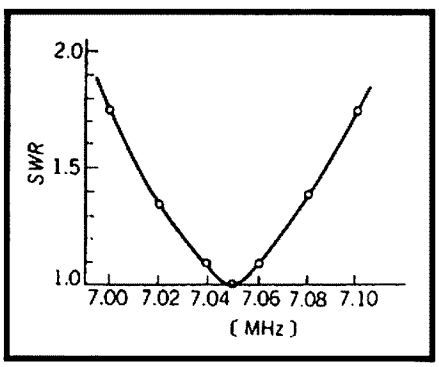


Fig. 13 VSWR curve.

wound over 105 mm using 0.8 mm diameter wire. A half nut is used to cut a thread into the plastic former to hold the windings about one diameter apart and to ensure a uniform pitch for the sliding contact used for shorting the turns. A three winding balun is used for connecting to the feeder.

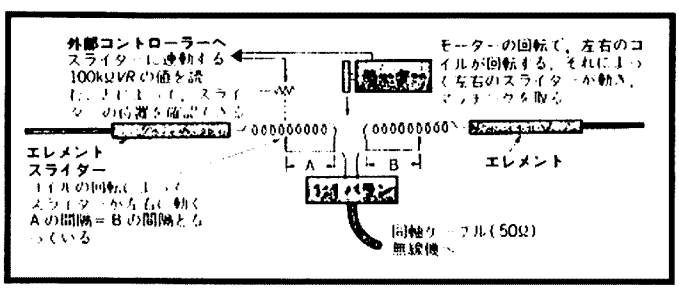


Fig. 14 General schematic of loaded dipole.

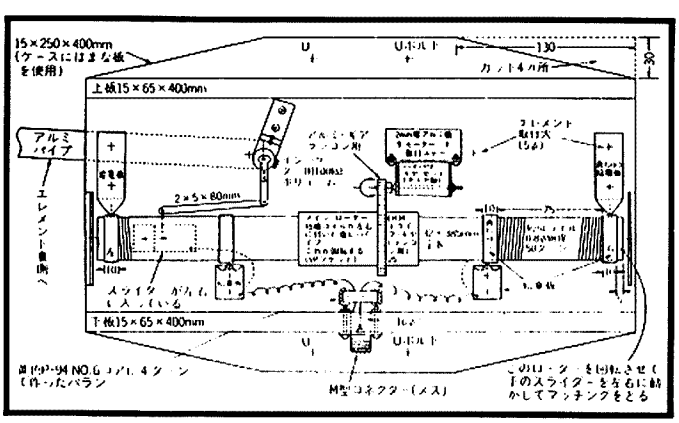


Fig. 15 Tuning arrangement.

Broad-band Monopole for 6, 2 and 0.7 m bands (Figs 16 & 17)

JP1EXE describes a broad band monopole fed against a ground plane with one element extended for operation on 50 MHz. The VSWR on both 50 and 144 MHz is 1.2:1 or less across the band and on 432 the VSWR varies between 1.0 and 1.4:1. See Fig 16 for details. Note that there are three 510 mm radials and one 1600 mm radial. The monopole is an open cage 1066 mm high and 610 mm across. It consists of two wire polygons mounted at right angles.

Four 510 mm angled vertical wires are mounted in between the polygons. While the dimensions are chosen to provide optimum matches on the amateur bands it should be a useful antenna for listening purposes from 50 to 500 MHz. In later episodes of *Random Radiators* we will bring some details of VHF and UHF antennas and some HF ATUs as well as more on HF antennas.

So its 73 from me and 73 from him.

The two Rons

ar

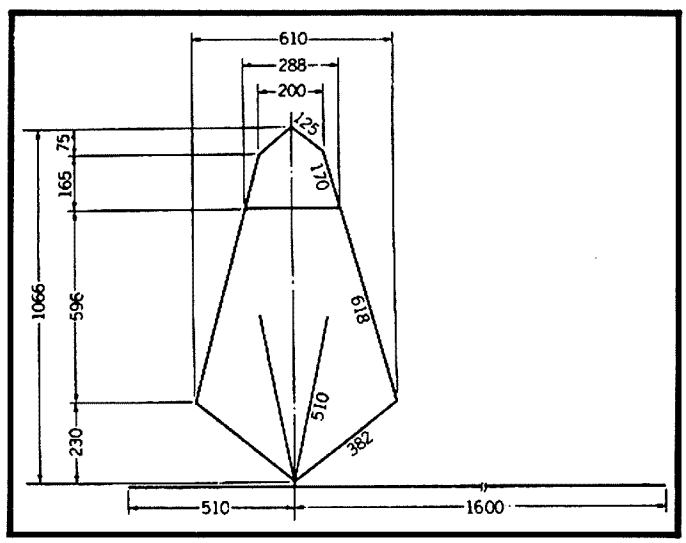


Fig. 16 Broadband monopole dimensions.

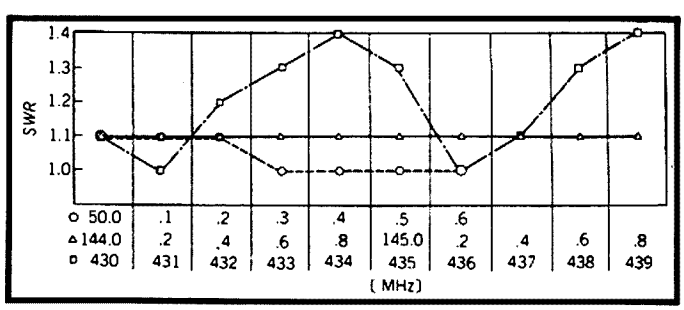


Fig. 17 Monopole VSWR curves.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BR293	$22.00
Ant. Compendium Vol 3 1st Ed. 1992	BR455	$37.00
Antenna Compendium Vol 2 — ARRL	BR292	$32.00
Antenna Impedance Matching — ARRL	BR257	$52.00
Antenna Note Book W1FB — ARRL	BR179	$26.00
Antenna Pattern Worksheets Pkt of 10	BR902	$3.00
Cubical Quad Antennas- Haviland — 1993	BR041	$37.50
Easy Up Antennas	MFJ38	$39.25
G-QRP Antenna Handbook — RSGB — 1992 1st Edition	BR452	$22.50
HF Antenna Collection — RSGB	BR391	$44.00
HF Antennas for all Locations — Moxon — 2nd Edition	BR188	$45.00
HF Antennas for all Locations — RSGB — 1993	BR088	$45.00
mntenna Compendium Vol 1 — ARRL	BR163	$26.00
Novice Antenna Notebook — DeMaw W1FB — ARRL	BR162	$20.00
Physical Design of Yagi — 3.5" IBM Disk	BR388B	$20.00
Physical Design of Yagi — 3.5" Mac Disk Excel Format	BR388C	$20.00
Physical Design of Yagi 5.25" IBM Disk	BR388A	$26.00
Physical Design of Yagi Antennas — The Book	BR388	$40.00
Practical Wire Antennas — RSGB	BR296	$32.00
Reflections Transmission Lines and Antennas — 5.25" IBM	BR348A	$22.00
Reflections Transmission Lines and Antennas — ARRL	BR348	$52.00
The Amenna Handbook — ARRL 1991 edition	BR370	$52.00
Transmission Line Transformers — ARRL	BR329	$52.00
Vertical Antenna Handbook — Lee — 1990	BR284	$22.00
Yagi Antenna Design — ARRL	BR164	$40.00
CALL BOOKS		
Radio Call Book International 1994	BR339	$55.55
Radio Call Book North America 1994	BR338	$55.55
RSGB Call Book 1993/4	BR465	$38.00
FICTION		
CQ Ghost Ship — ARRL	BR204	$13.00
Death Valley OTH — ARRL	BR205	$13.00
DX Brings Danger — ARRL	BR206	$13.50
Grand Canyon QSO — ARRL	BR207	$13.50
Murder By QRM — ARRL	BR208	$13.50
SOS At Midnight — ARRL	BR209	$13.50
HANDBOOKS		
ARRL Handbook — 1993	BR369	$66.00
Electronics Data Book — ARRL	BR201	$32.00
Radio Communication Handbook — RSGB	BR266	$56.00
Radio Theory For Amateur Operators — Swainston — 2nd Ed	BR265	$42.95
Space Radio Handbook — GM4IHJ — RSGB	BR439	$47.00
World Radio TV Handbook	BR450	$40.00
HISTORY		
200 Meters and Down 1936 — ARRL	BR198	$21.00
50 Years of the ARRL — 1981	BR196	$8.00
Spark to Space — ARRL 75th Anniversary	BR310	$26.00
INTERFERENCE		
Interference Handbook — Nelson	BR181	$25.60
Radio Frequency Interference — ARRL — 1992 Edition	BR186	$40.00
MISCELLANEOUS		
Amateur Radio for Beginners — RSGB	BR392	$13.50
Design Note Book W1FB — ARRL	BR357	$26.40
Ferrells Confidential Frequency Listing	BR387	$40.00
First Steps in Radio — Doug DeMaw W1FB	BR385	$14.00
G-QRP Circuit Handbook — G Dobbs — RSGB	BR441	$31.00
Ham Radio Communications Circuit Files	MFJ37	$24.95
Help For New Hams DeMaw — ARRL	BR308	$26.00
Hints and Kinks 13th edition — ARRL	BR193	$24.00
I Love Amateur Radio Car Bumper Slicker — RSGB	BR466	$2.75
I'm on the Air Car Bumper Sticker — RSGB	BR467	$2.75
National Educational Workshop 1991 — ARRL	BR384	$24.00
Novice Notes, The Book — QST — ARRL	BR298	$16.00
QRP Classics — ARRL — QST	BR323	$32.00
QRP Note Book — DeMaw — ARRL	BR170	$26.00
QRP Operating Companion — ARRL — 1992 1st Ed	BR010	$16.00
QRP Operating Manual — ARRL — 1992	BRR010	$16.00
Radio Auroras — RSGB	BR381	$30.00
Radio Buyers Source Book — ARRL — Volume 1	BR377	$40.00
Solid State Design — DeMaw — ARRL	BR171	$32.00
MORSE CODE		
Morse Code — The Essential Language	BR223	$16.00
Morse Code for Radio Amateurs — RSGB	BR451	$16.00
Morse Code Tapes Set 1: 5-10 WPM — ARRL	BR331	$18.50
Morse Code Tapes Set 2: 10-15 WPM — ARRL	BR332	$18.50
Morse Code Tapes Set 3: 15-22 WPM — ARRL	BR333	$18.50
Morse Code Tapes Set 4: 13-14 WPM — ARRL	BR334	$18.50
Morse Tutor 3.5" IBM Disk	BR187A	$20.00
Morse Tutor 5.25" IBM Disk	BR187	$20.00

	Ref	List Price
OPERATING		
Amateur Radio Awards Book — RSGB	BR297	$30.00
Amateur Techniques — G3VA — RSGB	BR393	$30.00
DXCC Companion — How to Work Your First 100	BR345	$16.00
DXCC Country Listing — ARRL	BR386	$5.00
FCC Rule Book — A Guide to the FCC Regulations	BR379	$24.00
Locator Map of Europe — RSGB	BR396	$6.00
Log Book — ARRL — 9" x 11" Wire Bound	BR202	$9.00
Low Band DXing — John Devoldere	BR195	$20.00
Operating Manual — ARRL — 4th Edition	BR192	$48.00
Operating Manual — RSGB	BR359	$31.00
Passport to World Band Radio	BR346	$45.00
Prefix Map of the World — RSGB (laminated)	BR397	$25.00
RTTY/AMTOR Companion ARRL 1st Ed 1993	BR045	$21.00
The Complete DXer — W9KNI	BR194	$32.00
Transmitter Hunting	BR222	$43.00
World Grid Locator Atlas — (Maidenhead Locator) — ARRL	BR197	$10.00
PACKET RADIO		
AX.25 Link Layer Protocol — ARRL	BR178	$21.00
Gateway to Packet Radio 2nd edition — ARRL	BR169	$32.00
Packet Computer Networking Conference 1-4 1982/5	BR166	$36.00
Packet Computer Networking Conference No 10 1991 — ARRL	BR378	$25.00
Packet Computer Networking Conference No 5 1986 — ARRL	BR167	$20.00
Packet Computer Networking Conference No 6 1987 — ARRL	BR168	$20.00
Packet Computer Networking Conference No 7 1988 — ARRL	BR164	$25.00
Packet Computer Networking Conference No 8 1989 — ARRL	BR295	$20.00
Packet Computer Networking Conference No 9 1990 — ARRL	BR360	$20.00
Packet Radio Companion ARRL 1993 1st Edition	BR285	$22.00
Packet Radio Computer Conference 1992 — ARRL	BR471	$32.00
Packet Radio Primer — G8UYZ — RSGB	BR440	$28.00
SATELLITES		
Satellite AMSAT 5th Space Symposium — ARRL	BR182	$17.50
Satellite AMSAT 6th Space Symposium — ARRL	BR199	$17.50
Satellite AMSAT 9th Space Symposium — ARRL	BR449	$25.00
Satellite Anthology — 1992 Edition — ARRL	BR180	$21.00
Satellite Experimenters Handbook	BR177	$52.00
Space Almanac — ARRL	BR299	$50.00
Weather Satellite Handbook — ARRL	BR324	$52.00
Weather Satellite Handbook Software 5.25" IBM Disk	BR326	$22.00
VHF/UHF/MICROWAVE		
Microwave Conference 1993	BR469	$32.00
Microwave Handbook Vol 1 — RSGB	BR318	$38.00
Microwave Handbook Vol 2 — RSGB	BR437	$57.00
Microwave Handbook Vol 3 — RSGB	BR447	$57.00
Microwave Update Conference 1987 — ARRL	BR174	$18.50
Microwave Update Conference 1988 — ARRL	BR183	$17.50
Microwave Update Conference 1989 — ARRL	BR321	$24.00
Microwave Update Conference 1991 — ARRL	BR446	$24.00
Mid Atlantic VHF Con. October 1987 — ARRL	BR175	$18.50
Spread Spectrum Source Book — ARRL	BR365	$52.00
UHF/Microwave Experimenters Manual — ARRL	BR325	$52.00
UHF/Microwave Experimenters Software — ARRL	BR327	$22.00
VHF 21st Central States Con. 1987 — ARRL	BR172	$18.50
VHF 23rd Central States Con. 1989 — ARRL	BR286	$17.50
VHF 24th Central States Con. 1990 — ARRL	BR322	$25.00
VHF 25th Central States Conference 1991 — ARRL	BR438	$25.00
VHF 26th Central States Conference 1992 — ARRL	BR446	$24.00
VHF 27th Central States Conference — ARRL	BR470	$32.00
VHF Companion — ARRL — 1st Edition — 1992	BR461	$21.00
VHF West Coast Conference 1992	BR444	$34.50
VHF/UHF 18th Eastern Conference — ARRL	BR445	$37.00
VHF/UHF Manual — RSGB	BR267	$40.00
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge — Diamond		$4.00
WIA Badge — Diamond With Call Sign Space		$4.00
WIA Badge — Traditional Blue		$4.00
WIA Badge — Traditional Red		$4.00
WIA Car Bumper Stickers		$0.50
WIA Car Window Stickers		$0.50
WIA Tape — Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book — 1994		$12.50
Band Plans Booklet		$2.80
WIA Log Book — Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all of the above items are available from all Divisions (and none is available from the Federal Office).
If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.
Divisions may offer discounts to WIA members — check before ordering. Postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.
The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

Technical Abstracts

Gil Sones VK3AUI

Two Metres and 70 cm Wavemeter

A wavemeter is a fairly basic piece of test equipment but it is a very useful piece of equipment. You can use it to check that you are in the band and you can sniff for harmonics and parasitics. You can use it to peak up equipment and you can compare the signal radiated by different aerials and transmitters. For a minimal outlay of cash, time and parts you can make a very useful piece of test equipment.

In the August 1993 issue of *Radio Communications,* the monthly magazine of the Radio Society of Great Britain, a simple two band design was featured by Sven Weber G8ACC. The design uses an Eddystone split stator tuning capacitor together with a coil and a loop plus a couple of diodes and capacitors, a switch and a meter. The meter does not have to be super accurate as it is only an indicator.

The circuit is given in Fig 1. The capacitor is shown in Fig 2 and the coil and loop are shown in Fig 3. The use of an Eddystone capacitor is not mandatory and any small split stator capacitor will do. The parts list is given in Fig 4. Remember that the parts are relatively non critical and that a good imagination and junk box will do wonders. If the junk box is empty then go to a few conventions and white elephant nights and open your wallet ever so slightly.

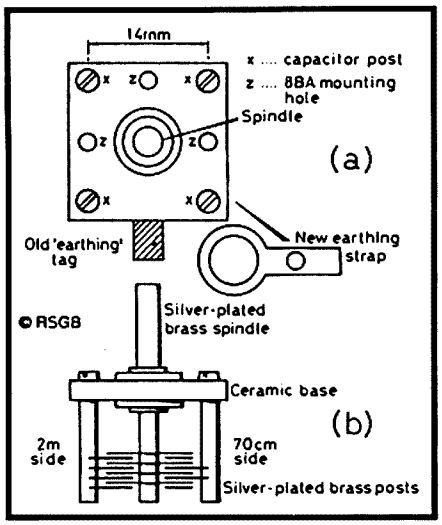


Fig 2 Construction of the tuning capacitor.

Calibration requires access to some known sources of RF. A counter and a GDO would be a good combination. Another combination would be an oscillator and a scanner. What you need is some RF to be detected by the wavemeter and some way of checking the frequency. If you don't have a counter or a scanner then you could always resort to that fine old standby of lecher lines. Look up a book if you are not familiar with them.

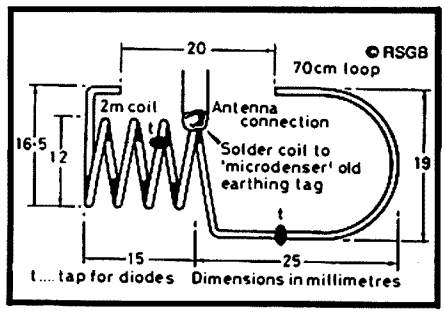


Fig 3 2 Band coil dimensions

Fig 4 Parts List
Capacitors
VC1 25 + 25 pF approx split stator
C1, C3 100 pF disc ceramic
C2 220 pF disc ceramic
Resistor
R1 8k2 0.25 W
Diodes
D1, D2 Schottky Diodes
D3 OA47

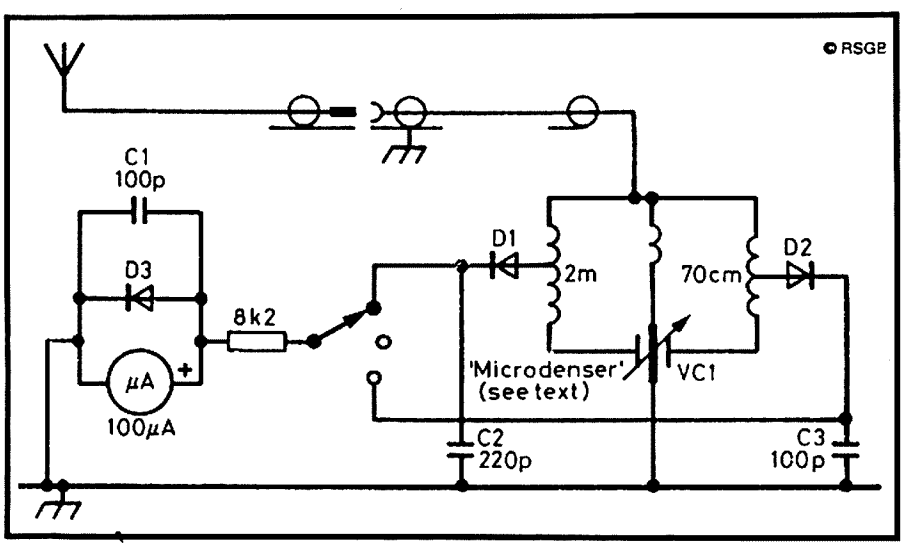


Fig. 1 Circuit of the wavemeter, showing how the split stator capacitor tunes both 2 m and 70 cm.

Evasive Noise Blanking

Noise blankers work well blanking noise but at times when the band is crowded with strong signals they can suffer. The receiver may have fantastic strong signal performance, but when you switch the blanker on other signals start to trigger it.

Mark Mandelkern KN5S writes about a technique which he describes as evasive noise blanking in the August 1993 issue of *QEX,* a monthly experimenter's publication from the ARRL. The technique relies on using a separate channel for the noise blanker. Early noise blankers did this by using a TRF on 40 MHz but this assumed that the noise picked up there was the same as that on the band you were using.

Mark uses the same front end for both the signal and the noise blanker but looks at an adjacent band for the blanker signal. This allows the signal to be picked up by the same antenna but by using a separate tunable noise channel the blanker can be tuned to an adjacent frequency which is not in use by strong stations. A block diagram is shown in Fig 5.

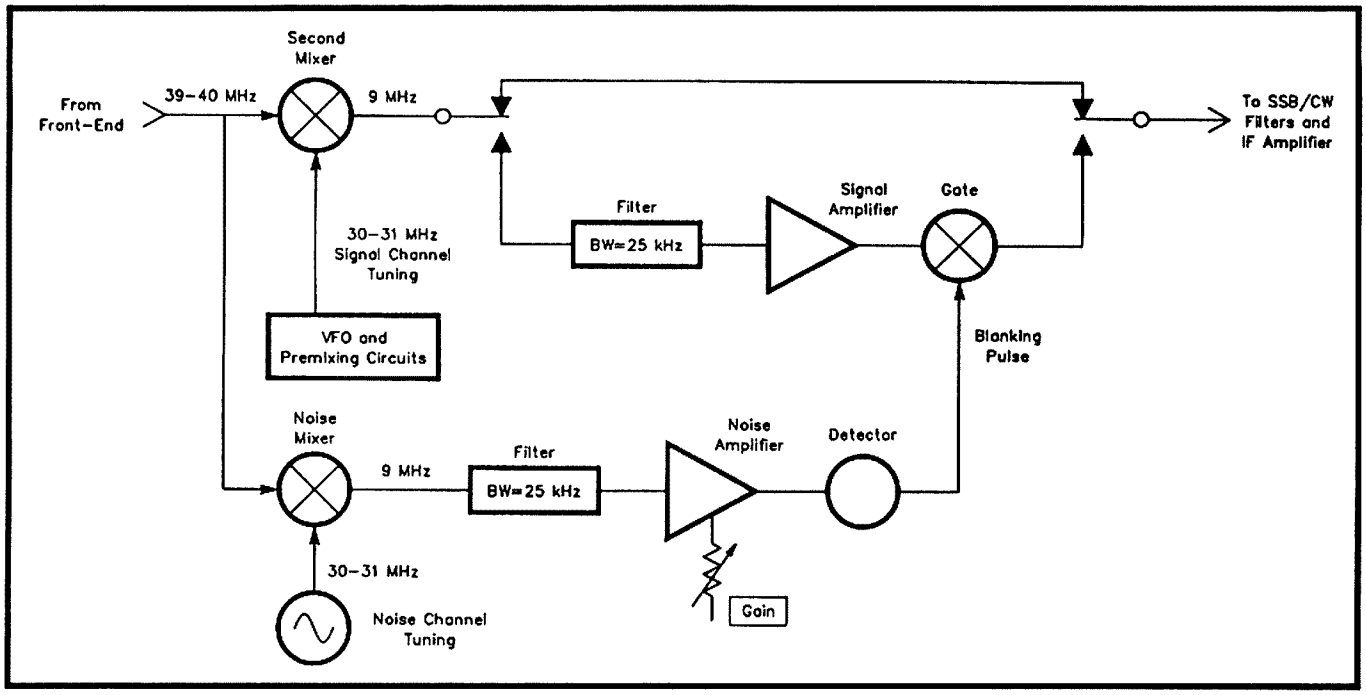


Fig 5 Block Diagram of Evasive Noise Blanker.

C1 ..... 0.047uF
C2 ..... 0.001uF
C3 ..... 100uF
C4 ..... 0.01uF
C5 ..... 820pF
C6 ..... 0.001uF
C7 ..... 0.001uF
C8 ..... 0.1uF
C9 ..... 0.1uF
C10 ..... 0.047uF
C11 ..... 0.01uF
C12 ..... 0.047uF
C13 ..... 10uF
C14 ..... 10uF
C15 ..... 0.047uF
C15 ..... 250uF
C17 ..... 500uF

R1 ..... 6.8K
R2 180
R3 ..... 3.9K
R4 220
R5 47
R6 ..... 4.7K
R7 ..... 2.2M
R8 150
XT 7020kHz
L1 ..... 10uH

L3 ..... 1mH

TR1 ..... 2N2222A
TR2 ..... 2N3553
TR3 ..... BC108C
D1 ..... AA112
D2 ..... AA112
Z1 ..... 1N4751
VR1 ..... 1K Lin
VR2 ..... 5K Log
IC1 ..... LM 386
VC1 ..... 5-50 pF Variable
VC2 ..... 8-80 pF Praset
VC3 ..... 8-80 pF Preset

T1 ..... 27 Turns 32 swg on T50-2. Secondary 3 turns.
T2 ..... Same as T1
T3 ..... Primary winding of transistor transformer.
L2 ..... 13 turns 32swg on T50-2 torold.

All capacitors in µF otherwise specified.
All resistances in ohms. Transmit/Receive switch.
Double pole change over.

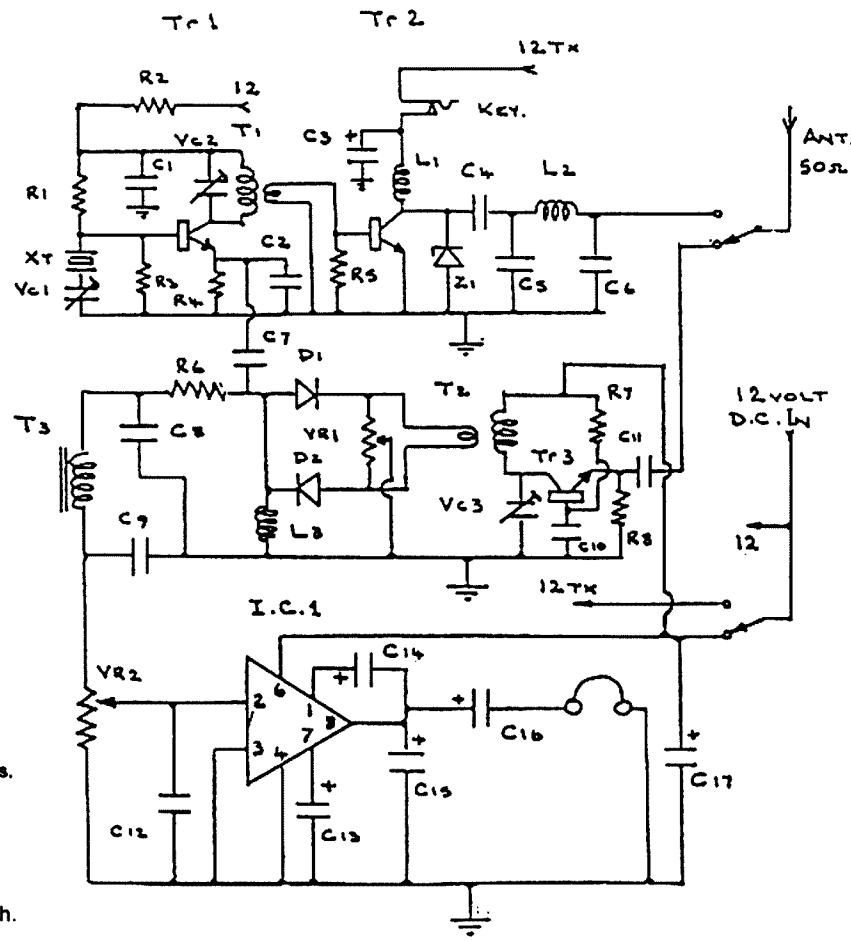


Fig 6 QRP Transceiver.

The system does require separate tuning of the blanker but that is a small price to pay to be able to use the blanker on a crowded band. The author's system was built as part of a tunable IF for a VHF receiver.

ZS5L QRP Transceiver.

A simple 40 metre QRP transceiver was described in the September 1992 issue of *Radio ZS*, the monthly journal of the South African Radio League, by Roger Davis ZS5L. The design would be adaptable to other bands and should give reasonable performance running on lantern batteries or gel cells.

The CW sidetone offset is produced by the oscillator frequency variation when the transmitter current drain lowers the battery terminal voltage. A happy side effect and a graphic demonstration of how voltage dependent oscillator stability can be.

The circuit and parts list are given in Fig 6. A simple project but capable of providing a lot of fun and education.

Roger Beep

Braam Devenier ZS6AYE describes a simple tailender tone beep in the June issue of *Radio ZS*. This produces a tone beep as you let go of the PTT button giving the other station a cue that you have put the contact over.

A very useful cue if the signals are weak and fading in and out of the noise. This fading is quite commonly experienced on VHF SSB DX.

The circuit is very simple and is shown in Fig 7. The connection of the device is shown in Fig 8. The parts list is given in Fig 9.

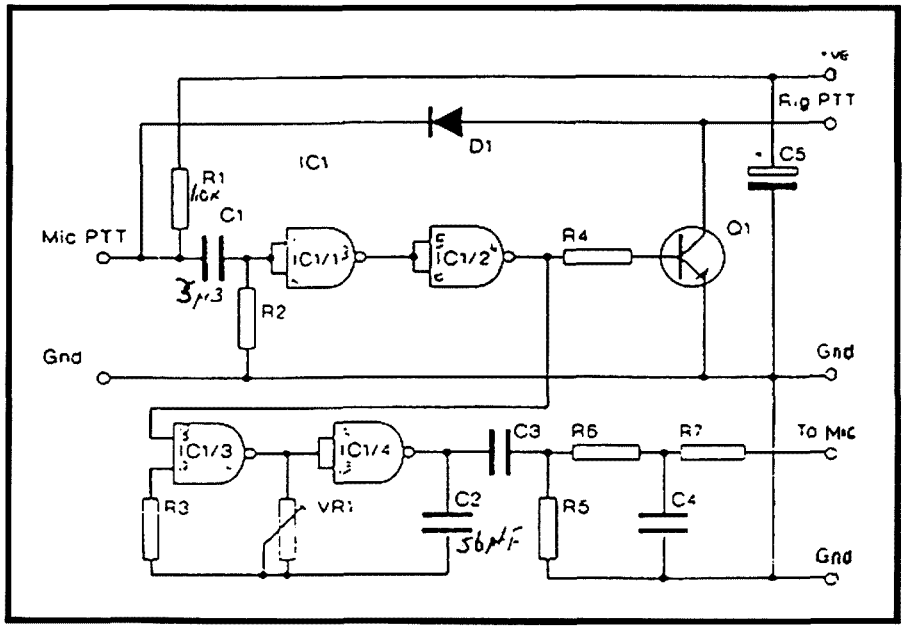


Fig 7 Roger Beep.

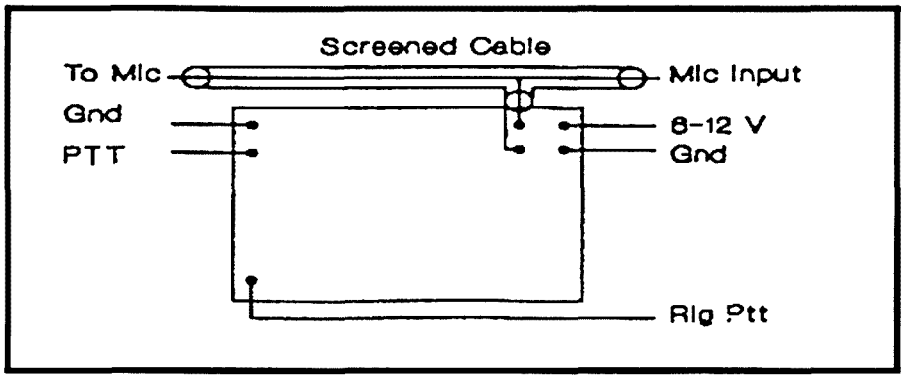


Fig 8 Connection of Roger Beep.

Fig 9 Parts List
R1 10 K
R2, R7 100 K
R3 1 M
R4 1 K
R5, R6 4K7
C1 3μ3 25 VW
C2 56 nF
C3, C4 47 nF
C5 1 μ 25 VW
Q1 BC109
D1 1N4148
VR1 10 K
IC1 CD4093
Resistors 1/8 W

ar

WIA News

Russian Callbook

A copy of the 1993 CIS Call Directory, the fourth edition published by the Octavia Co, has been received by the Federal Office.

The 323-page soft-bound edition contains the direct mailing adddresses of over 30,000 Russian amateurs plus thousands of additional addresses of hams in the Ukraine, Belarus, Azerbajan, Georgia, Armenia, Turkmenistan, Uzbekistan, Tajikstan, Kazakhstan, Kirghizstan, Moldova, Estonia, Lithuania and Latvia, according to the accompanying press release. All of the addresses are printed in both English and Russian.

The Directory also contains a list of some 500 Russian regional QSL Bureau addresses, organised by callsign prefix.

Octavia has also published the QSL Manager Review, a hardcover directory containing a listing of more than 47,000 QSL managers.

These Octavia publications are available from:

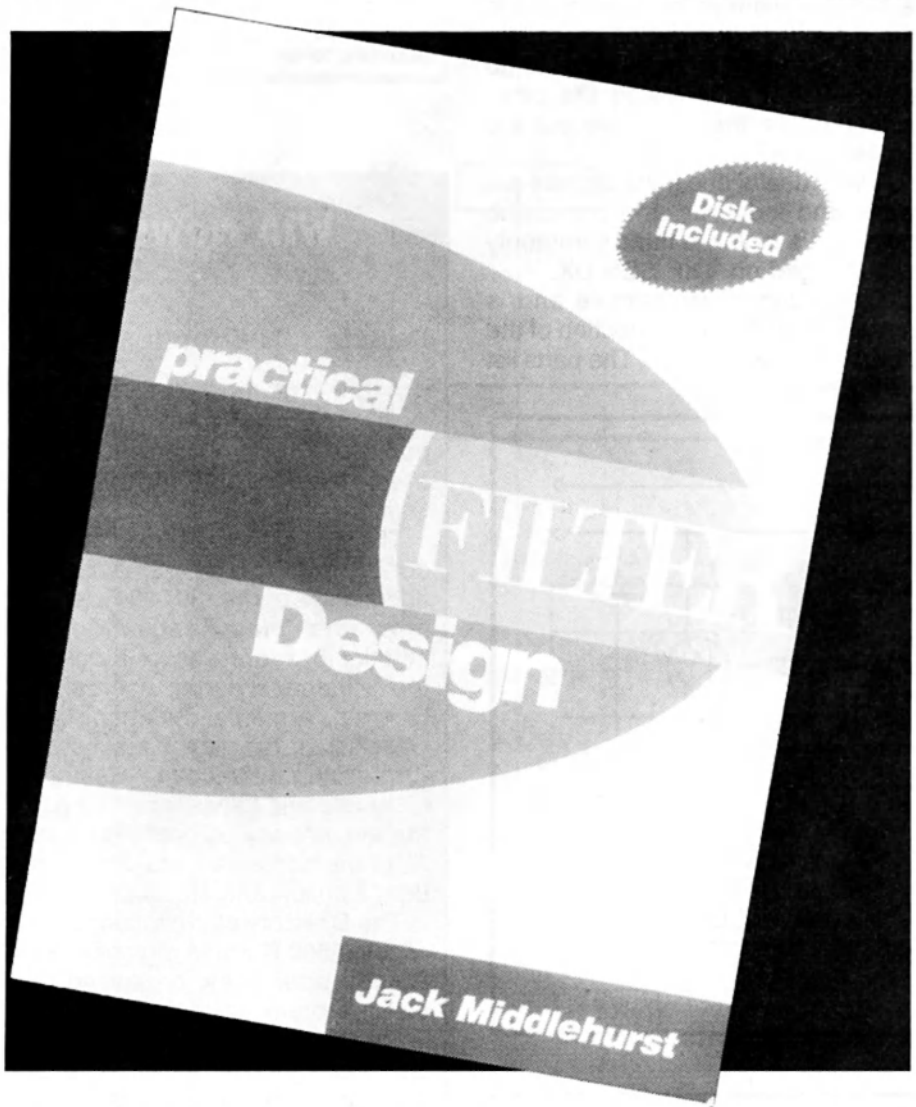
j-Com
793 Caning Pkwy,
Victor NY 14564 USA

The CIS Callsign Directory costs $US10 plus $US6 shipping, while the QSL Manager Review costs $US10 plus $3 for shipping.

Book Review

Practical Filter Design

Reviewed by John Robinson VK2XY



Author: Jack Middlehurst. Edited by Roger Harrison VK2ZTB.
Published by Prentice Hill of Australia.
Soft Cover. 270 pages. 3.5-inch disk of programs included. $39.95.

This book covers filters found in amateur radio, audio and other applications. The book's nine chapters each cover a particular type or class of filter, giving the various circuit arrangements, the filter properties (good things and not so good things) their tuning and construction details. Typical uses are discussed, and active versions are covered.

Filter types described include: Butterworth, Chebychev, Elliptic (including active Elliptic), strange beasts called GICs, Gyrators (no, not Sharon Stone on the dance floor) and switched capacitor filters. One chapter discusses such interesting variations as Linkwitz, Lipshitz, Bessel and notch filters.

This book answers all the questions you ever thought possible about filters, indicates which ones to choose for specific applications and discusses their limitations.

But the good news is that no longer do you need to have a degree in mathematics to design yourself a filter. The book includes a disk of computer programs for every filter described, to help you design the exact filter for YOUR application.

The programs are written in GWBASIC and will run on any IBM compatible PC. Program listings are included in the chapters so that you can "read" them if you're interested, and so that they may be "translated" into other forms of BASIC for use in different computers (Commodore, for example).

The book is written in an easy to understand style and is an excellent reference manual. I was fortunate to attend the book launch, which was held at the NSW Division's Parramatta headquarters, and heard Professor Godfrey Lucas VK2CJL (Dean of Electrical Engineering at the University of Western Sydney) extol the virtues of the book. He was enthusiastic not only about the content, but about the writing.

The NSW Division has it in stock in the Divisional Bookshop.

ar

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse side of the Amateur Radio address flysheet.

ALARA

*Robyn Gladwin VK3ENX**

The ALARA History 1975-1993. 1st Edition Mavis Stafford VK3KS, 1989. Latest Update Marilyn Syme VK3DMS, 1993.

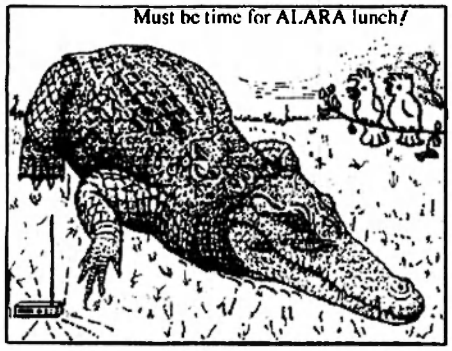
Mavis Stafford is to be congratulated for her excellent work in documenting the progress of our Association. She tells of the efforts of Norma Boyle VK3AYL, to encourage women to become interested in amateur radio and of the first nets on 21 July 1975. She then follows with chapters on the background to the Newsletter, the Symbol and the badges, the ALARA contest and the distinctions gained by ALARA members. Our thanks also go to Marilyn Syme VK3DMS, for her efforts to bring the History up to date. Copies are available from Marilyn, QTHR, for a small charge.

ALARAmeet 1996

Bev Hebiton VK6DE, has taken over from Poppy Bradshaw VK6YF, as VK6 State Representative, to give Poppy a break. Poppy will remain our Sponsorship Secretary. Bev really enjoyed her trip to Castlemaine for the ALARAmeet and is already planning the 1996 event. Although it is a long way to travel, Bev hopes that as many ALARA members as possible will try to make the trip with their families.

Special Awards

During the official ALARAmeet proceedings, an award for outstanding service to ALARA was presented to Val Rickaby VK4VR, our Treasurer for 7 years. A special certificate was also awarded to Brian Rickaby VK4RX, for his assistance in setting up the database for the ALARA records. Val and Brian are pictured receiving their special awards from Maria McLeod VK5BMT.



Luncheons

During the year these functions have been most successful. ALARA members in VK3, VK5 and VK6 have been able to both keep in touch with each other and provide an opportunity to entertain overseas and interstate visitors. Jenny Warrington VK5ANW, while on a recent trip and unable to attend the usual luncheon, sent a post card instead. In her usual style, Dorothy Bishop VK2DDB, used it as the inspiration for another of her classic cartoons. Members in VK3 are reminded that the luncheons will not be held in December or January, and VK5 YLs will not meet in December. Seasons Greetings.

ALARA members wish all readers a safe, happy and prosperous Christmas and New Year.

*PO Box 438 Chelsea 3196 VK3ENX @ VK3YZW

ar

Val Rickaby VK4VR & Brian Rickaby VK4RX receiving special awards from Maria McLeod VK5BMT.

WIA News

WIA Membership

There were 6223 financial members of the WIA as at 30 September 1993. With almost 3500 members residing in New South Wales and Victoria, the memberships of these two Divisions comprise just over 55% of the total WIA membership.

The Federal Office sent out 24 recruitment packages in October on behalf of Divisions, in response to enquiries from people interested in joining the WIA.

AMSAT Australia

*Bill Magnusson VK3JT**

1993 and all that....

Well here we are at the end of another year. Perhaps a review would be in order.

- The year began with an announcement that major design changes would be required to the phase 3D spacecraft. A change in the structure of the rocket connecting ring that was to house P3D forced a total re-draw of the space frame. All was not bad news though as the new design allowed for a more uncluttered and more efficient "antenna farm" on the top surface.
- KitSat's BBS became operational early in the year and has continued to take the pressure off UO-22. It has since been joined by KitSat-B.
- We saw the launch and subsequent demise of the long awaited ARSENE satellite. This was the most disappointing event of the year. What a shame to think of that dead satellite still orbiting in what was the best of all amateur radio satellite orbits. Southern hemisphere amateurs in particular should mourn the passing of this bird.
- A highlight of the year was a series of articles on "S" mode by James Miller G3RUH. They are recommended reading for all satellite buffs. Written in James' usual catchy and informative style, the articles have been re-printed in just about every amateur radio satellite magazine in the world. They have been responsible for kindling interest in this mode in many radio shacks (including mine). I have an "S" mode system ready for our annual mountain-top expedition around new year.
- Graham VK5AGR produced the 100th issue of the Amsat-VK newsletter in August. Quite a milestone.
- Oscar-13 (and the control stations) were subjected to their greatest challenge yet with a long series of eclipses which are still taking effect as this goes to print. Their success is obvious from the way that OSCAR-13 has managed to weather the storm and still keep performing.
- A new batch of satellites with amateur radio capability have appeared. Kitsat-B, Eyesat-A, IT-Amsat and PO-sat were all launched successfully in September.
- A high-light of the pre-Christmas period last year was when Musa Manarov visited Melbourne. The excitement carried over into this year so it's worth including in our review. He and his party were entertained over a period of 5 days by a number of VK3s and he was interviewed along with Maggie VK3CFI and Bob VK3ZBB by Australian Geographic magazine. His visit included a voice contact with MIR using a 1 watt hand-held transceiver belonging to Peter VK3CPO.
- The MIR crew changed over in July this year with Vasily R3MIR and Alex R4MIR taking over from Alex R2MIR and Genady R9MIR. The new crew have been very active on 2 metre packet and voice.
- Some rather special educational activities have resulted from the crew change. In particular we saw Steve VK3CAX's year 12 physics class in a delightful exchange with Aleksandr, their "Orbiting Professor" on MIR. We saw the girls from Rob Chapman's year 12 physics class at St Columba's college in Essendon send the entire school into raptures with their MIR contact being broadcast over the school PA system.
- In April the MIR crew had the first space to space amateur radio QSO with the crew of the American space shuttle. Various MIR and shuttle crews had attempted to do this before. Another first for amateur radio.
- We saw the old RS-1 satellite spring back to life and although it is only sending meaningless signals it is being tracked again with interest after some years of silence.
- Darrel AA7FV broke the long standing record for the best score in the ZRO tests. He scored perfect copy at level A, 30 dB down from the beacon. Most well equipped OSCAR stations would struggle to hear signals 15 to 20 dB down on the beacon.
- As I write this it is 2.30 am and Ray VK3YPY and I are waiting for the moon to rise. Why, you ask? This is the week-end of the ARRL EME contest and we are hopeful of using my OSCAR antenna system to receive EME signals originating from VE3ONT at Algonquin, Canada. They are using a 150 foot radio astronomy dish for the occasion. They are not in the contest, of course, but are giving amateurs with less than EME stations the opportunity to hear signals from the moon. We sat up until 4.00 am last night and were rewarded by reception of very weak

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-Ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)
Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/– 5 kHz for QRM.
AMSAT Australia newsletter and soft-ware service
The newsletter is published monthly by Graham VK5AGR. Subscription is $25 for Australia, $30 for New Zealand and $35 for other countries by AIR MAIL. It is payable to AMSAT Aust addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of October 1993

L10152	MR G R TOOTELL
L20960	MR M J DARBY
L30868	EAST GIPPSLAND ARC INC
L30869	MR A CRUTCHLEY
L30870	MR T MORRISON
L50319	MR J A DUNN
L70116	MR H G LENNON
VK2ALG	MR T R CLARK
VK2FP	MR B J MCNEIL
VK2LOG	MR G OGDEN
VK2TAU	MR D M BREM
VK3ZUY	MR N J GUY
VK4AAG	MS A GIANOLI
VK4FDR	MR A R RHODES
VK4KGV	MR D U CONN
VK4KNE	MR D A NELIGAN
VK4TCJ	MR C J WILLIAMS
VK4ZNZ	MR W E BOOTH
VK6AGI	MR P AGAPITOS
VK6FF	MR C T SCOBLE
VK6NAM	MR A M KELLY
ZL2AIH	MR A G F HARDING

EME signals on my 20 turn, 435 MHz helix with feed point pre-amplifier. Ray and I were quite excited about hearing the moon reflections for the first time. Tonight is 1296 MHz night and all is ready. We built a 44 turn helix with feed point pre-amp specially for the purpose. Hope all goes well. It's a bit hard to type with one's fingers crossed.

- All in all it's been quite a year. I've been involved in a lot of different fields of activity in amateur radio over the past 43 years, from transmitter hunting to DXpeditioning, home brewing to packet radio, but this amateur radio satellite business wins hands down.

APRS

I'm still collecting bulletins about this system. As far as I can make out it uses packet to plot the position of the received station on a map. It appears to be applicable to digipeating through amateur satellites and can be very useful in conjunction with GPS receivers. I still don't have enough information for a definitive description for this column but if any-one has such info I'd be glad to hear from them. Maybe more next month.

Amateur Radio Satellite Frequency and Mode List

I'll start off the new year with a list of modes and frequencies for all the currently operational amateur radio satellites. This will appear in the January column if I have all the information to hand by the 29th November deadline.

Christmas and New Year Wishes

Have a wonderful relaxing yet productive time over the break. As usual I will be going to Mt Skene in the Victorian alps for our annual satellite expedition. Look out for us on AO-13 mode "S" and most other satellites.

73 for now and for 1994, Bill VK3JT.

**359 Williamstown Rd Yarraville VIC 3013*
Packet: VK3JT @ VK3BBS

ar

Awards

John Kelleher VK3DP — Federal Awards Manager*

May I take this opportunity to wish all YLs, OMs and SWLs the compliments of the approaching festive season, with the hope that the new year of 1994 brings to all, those things which they have earned and justly deserve.

In keeping with the Christmas theme, what could be more appropriate than "the worked Santa Claus Land Award". Here are the details:-

Work Northern Finland stations prefixed OH9, OF9, OG9 & OI9 after 15th January 1986. Special station OH9SCL is located in the Arctic Circle in Finnish Lapland. A total of 10 (ten) points for DX stations is required, the point values being one point for each OH9 etc, etc, except in December, when each is worth 3 points. There are no band or mode restrictions. No station can be worked more than once. GCR list and a fee of US$6.00 or 10 IRCs to OH9AB Award, PO Box 50 96101 Rovaniemi Finland.

New DXCC Country — Reinstatement

This issue brings news of the re-instatement of Eritrea as a DXCC country. In a DXCC desk news release dated September 9th 1993, the ARRL awards committee voted unanimously to accept a recommendation of the DXAC to reinstate Eritrea as a DXCC country. The awards committee voted 4 to 3 to make reinstatement effective from May 24th 1991.

The DXCC desk (ARRL) will accept QSL cards for Eritrea starting January 1st 1994. Any cards received before this date will be returned without action. Those who have credit for deleted Eritrea need not re-submit cards. Eritrea was deleted from the DXCC countries list in 1962 after it was annexed by Ethiopia. Liberation came on May 24th 1991 when forces of the Eritrean Peoples Liberation Front gained control of the country. The really good news is that by selecting May 24th 1991 as the effective date for re-instatement, all operations from Eritrea now count for DXCC credit, including 9ER1TA and 9ER1TB by the Hensons in 1992. This moves the total DXCC countries list to 328 countries.

Consequent to this news, it became my duty to ransack my DXCC active files pre 1962 to find out who had confirmation for Eritrea, by looking up their deleted countries list. I am sure that previous award managers had pre-arranged the chaos which confronted me. After much muttering and sneezing I came up with a short list (from my active files) which I present below. If perchance I have overlooked one or two in the process, I apologise, and ask those I missed to submit their claims. Here is the list:-

VK2s QL SG APK
VK3s JA XB YL
VK4s BG KS LC RF
VK5s MS WO XN
VK6RU
VK7LZ.

Remember, these calls were extracted from active files only.

Special Activity Over the December-January Period

John Martin VK3KWA, Chairman of the Federal Technical Advisory Committee (FTAC), and manager of the Ross Hull contest for 1993-1994 (which runs from December 26th to January 16th) has asked me to publicise that portion of this contest which deals with Maidenhead locators or grid squares. John has gone to a great amount of trouble to inform last years' placegetters in this regard, and to drum up as much enthusiasm as possible. To assist John, and to set the scene, here again are the rules which govern the grid square award.

Grid Square Awards

Rules

1. (a) The Wireless Institute of Australia Grid Square Award (WIA GSA) is awarded for contact with a minimum number of "Maidenhead" 2 degree x 1 degree grid square locators per band as indicated in (b). Grid Squares are designated by a combination of two letters and two numbers.

(b) The minimum number of squares needed to initially qualify for each individual band award are as follows:

All HF bands (including WARC bands)	100
50 MHz	50
144 MHz	30
432 MH	25
1296 MHz	10
13 cm	5
all bands above	5

2. Only contacts made on or after 1 January 1990 are creditable for this award.

3. (a) Individual band awards are endorsable in the following increments:

All HF bands	25
50 MHz	10
144 MHz & all bands above	5

(b) Separate bands are considered as separate awards.

4. (a) No crossband contacts permitted.

(b) No contacts through active repeater or satellite devices or any other relay method permitted.

(c) Contacts with aeronautical or maritime mobile stations do not count.

5. Stations who operate portable or mobile from a different locator than their "home" locator may claim the locator they are operating portable from by either of two methods:

1. work a station located in their "home" locator

2. work at least five different stations outside the portable locator

3. on bands 1.2 GHz and above, work at least one station outside the portable locator.

6. (a) All contacts for all of the individual band awards must be made from a location or locations within the same grid square, or locations in different grid squares no more than 50 kilometres apart. This will be called the "HOME" locator. Excepting contacts made under the provisions of Rule 5

(b) A specified amount of contacts for the basic award needs to be made with stations located in Australia or its territories (ie any prefix VKO to VK9) as per the table below:

All HF bands	25
50 MHz	10
All other bands	1

7. Endorsements will be available on request, ie however you want it endorsed is how it will be done.

8. (a) QSL cards are not required; a certified log extract should be provided with the following information:- Date, time, callsign, mode, frequency, grid locator and signal report sent by the station concerned, and grid you are operating from if portable.

This list should be certified by an official of a society affiliated with the WIA, or by two licensed amateurs, reading as follows: "I/we certify that the enclosed list corresponds with the information contained in the said logbook."

(b) For those who would have difficulty in getting a certified list, photocopies of your logbook signed by the applicant certifying all the information contained within to be true and accurate can be certified by the Awards Manager. Note: All entries must be legible.

9. The cost for each award is Australian $5.00 for amateurs in Australia, or $US5.00 or eight IRCs for those outside Australia. Requests for endorsements should be accompanied by an SASE or one IRC and an SAE.

10. This award is very much dependent upon the honesty of the operator. As such, any fraudulent applications will result in the disqualification of the applicant from all future WIA GSAs.

11. Any decisions regarding interpretation of the rules here printed made by the Federal Awards Manager are final and binding.

12. There will also be a standing list of the top five scorers on each band, so people can see just what is possible and what is being achieved. This may encourage those who think they will never reach their target. It will also give those who like a bit of competition something to aim for.

The weekend of January 15th and 16th 1994 (the VHF-UHF field day weekend) has been set aside as an "activity" weekend for the grid square award. References to the Ross Hull award have already been made in other sections of this magazine.

New Russian Amateur Headquarters

A new centre for Russian amateur activity has been created in Moscow. The Soyuz Radiolyubitelej Rossii (SRR) is, in English, the Union of Radio Amateurs of Russia. It was legally registered on 5th April 1993 by the Ministry of Justice of the Russian Federation as a national amateur radio organisation. The SRR is now seeking IARU endorsement and subsequent membership. The SRR invites all national amateur radio societies to co-operate in correspondence and QSL exchanges. The mailing address is:- SRR PO Box 59 Moscow 105122 Russia.

The address for the inwards/outwards QSL bureau is the same as the mailing address. For general purposes, it is believed that this new organisation replaces the old PO Box 88 Moscow. Requests for further information should be sent to the above address.

Tassie Trout Award

For VK or ZL stations to qualify, work or catch 14 kg of "Trout" (members of the Central Highlands Amateur Radio Club of Tasmania). The president VK7KZ, vice presidents VK7NBF & VK7NAW, treasurer VK7NDO and awards manager VK7JWR are each worth 2 kg. The club station VK7CHT equals 3 kg. Any member portable in the Central Highlands of Tasmania equals 2 kg. All other members, of which there are about 80 spread around Australia, equal 1 kg each.

All other countries (except Australia and New Zealand), need only 4 kg. Contacts can be made on any band and any mode. The club meets on 3585 kHz at 1930 local time on Thursdays.

Cost is $5.00. The Golden Trout award sticker for contacting 25 members, and the Platinum Trout award sticker for contacting 50 members cost $2.00 each.

The award manager is Bill Reid VK7JWR at 40 Wentworth Street Bellerive TAS 7018.

Spirit of Tasmania Award

This is a special event for the new ship, Spirit of Tasmania, which will commence service by the end of the year. It will be a sea link between Tasmania and Victoria and the replacement for the current ship in service, the Abel Tasman.

The Award will be an embossed photograph of the Spirit of Tasmania which will be forwarded to all Amateurs qualifying for the Award. The cost of the Award will be $AUS5.00 or $US5.00 American or 7 IRCs. These charges are to cover costs.

Awards Manager is VK7NBF Bob Jackson, Falmouth House, Falmouth, Tasmania, 7215 Australia.

The call sign for this event will be **VI7STA.**

Qualifications for Award: Licensed Amateurs must make a contact with a Special Event rostered VK7 Amateur station and definitely make the contact with him so he can log it. Shortwave listeners are to state the callsign of both stations making the contact plus the date and time.

There is only one contact you have to make for the award. Three details are needed to qualify. These are: The call sign of the rostered amateur station, date and time in UTC.

Call Frequencies: 3.590, 14.190, 18.140, 21.190, 28.590 — 2 metres and packet + or — QRM. Special Note for CW: 3.530, 14,010 will be CW only + or — QRM. Special note for listening on SSB phone, etc. If propagation is down or there is little activity the rostered amateur station will call on every UTC HOUR and HALF HOUR.

Dates: Starting 27 November 1993 and finishing 23 December 1993.

Due to time limit, no QSL cards will be given out. However, the rostered VK7 amateur station can use his own private QSL card. This is recommended.

**PO Box 300 Caulfield South VIC 3162*

ar

Remember to leave a three second break between overs when using a repeater.

DICK SMITH ELECTRONICS

QUALITY TRANSCEIVERS AT SPECIAL CHRISTMAS PRICES!

2 Year Warranty

FT-747GX Compact H.F Transceiver

The FT-747GX is a compact SSB/CW/AM transceiver providing 100 watts PEP output on all 1.8-30MHz bands, and reception from 100kHz to 30MHz. Includes a front panel mounted speaker and an easy-to-read backlit digital display, dual tuning steps for each mode, dual VFO's for split-frequency operation and 20 memory channels. Complete with wideband 6kHz AM and narrow 500Hz CW IF filters, plus MH-1 hand microphone.

Cat D-2930

$1299*

*Ex-demo units

WITH ANTENNA BONUS! Your choice of 2 'Mobile One' mobile HF antennas from our range of 80m, 40m or 20m whips. ***Worth over $90***

RMK-747 Remote Mounting Kit

Allows the front panel of the FT-747GX to be mounted away from the body of the transceiver. Price includes installation on your FT-747GX.

Cat D-2931

SAVE $50

$299

FT-890 All Mode HF Transceiver

Hurry, price must rise January '94. Buy now and save!

The outstanding FT-890 is a rugged, 100-watt PEP mobile transceiver that covers all HF amateur bands in SSB, CW, FM and AM modes, plus provides continuous reception from 100kHz to 30MHz. Two direct digital synthesisers (DDSs) provide pure local signals and fast t/r changeover, while the low noise receiver front-end offers excellent receiver dynamic range performance. The switchable RF amplifier and a 12dB attenuator provide clear copy of even extremely strong signals, while interference rejection is facilitated by both IF Shift and IF Notch filters.

Two independent VFOs per band are provided, plus 32 memories which store data from both VFOs. There's also an effective, variable noise blanker, and a CW iambic memory keyer plus an adjustable passband-shifting speech processor which lets you tailor SSB transmitter audio to your own voice and microphone characteristics. The FT-890 weighs less than 6kg, uses modular design and surface-mount components to ensure highly reliable operation and comes complete with an MH-1 hand mic. An optional internal automatic Antenna Tuner (ATU-2) is also available, which can be controlled from the front panel.

Cat D-3270

2 Year Warranty **$1995**

2 Year Warranty

FT-990 H.F All-Mode Base Transceiver

The FT-990 offers many of the features of the legendary FT-1000 in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver uses a wide dynamic range front-end circuit and two DDS's to provide a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM), with high duty cycle transmissions allowed.

The internal auto antenna tuner and inbuilt AC power supply are standard features, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch filters, IF bandwidth selection, 90 memories and one-touch band selection.

Cat D-3260

$3995

Bonus Deluxe desk microphone (MD-1), valued at $199.

*Offer expires 31st December 1993.

Deluxe Handheld FM Transceivers

The superb FT-415 and FT-815 hand-held FM transceivers are compact and rugged with dual-microprocessor control, a range of new automatic battery-saving (ABS) features and power output which is selectable in up to 4 levels at 12V. A die-cast rear case, polycarbonate front panel and battery case ensure reliability in the most demanding of environments. The display and keypad can both be backlit, and the top panel DC supply jack can be used to power the transceiver and charge a NiCad battery pack. A 36mm speaker provides low distortion audio, while in-built VOX circuitry is included for use with the optional YH-2 headset. Advanced features include two independent VFOs, keypad frequency entry, 41 tunable memories, instant recall CALL channel and various scanning modes. The FT-415 has Automatic Repeater Shift (Australian version), which can be activated whenever you tune to a standard repeater sub-band, plus extended receive coverage. Both have DTMF-based selective calling and paging facilities and come with a high-capacity 7.2V, 1000mA/H NiCad battery, belt-clip, carry case and approved AC charger.

FT-415 Cat D-3610 **$599**

FT-815 Cat D-3615 **$699**

Specifications:

Frequency range:	FT-415 144-148MHz (140-174MHz extended receive) FT-815 430-450MHz
Size:	55 x 146 x 33mm
Transmitter:	
Power output:	FT-415 2.0W (at 7.2V) FT-815 1.5W
Both models:	5.0W at 12V
Receiver:	
Sensitivity:	better than 0.158uV, (12dB SINAD) both models, Ham bands only

BONUS Purchase any 2m or 70cm handheld during December, and we'll give you a 25% discount on any matching speaker/mic or NiCad battery pack purchased at the same time.

FL-2025 Amp

Turn your FT-290RII into a powerful 25watt mobile/base transceiver with the FL-2025 amplifier. This clip-on RF amplifier replaces the FBA-8 battery holder on the FT-290RII. Requires 13.8V DC.

Cat D-2863

$299

FT-290RII 2M Multi-Mode Transceiver

The multi-mode, transportable transceiver for serious field or mobile operations! The FT-290RII features FM, SSB (USB/LSB), and CW operation with 2.5W output, twin VFOs and 10 memories. Selectable tuning rates are provided for SSB/CW and FM, while mode-specific features such as noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make this unit very simple to operate. Comes with an FBA-8 battery holder for nine "C" size standard or NiCad batteries (not supplied), antenna and hand-held microphone.

Cat D-2875

2 Year Warranty

$999

FT-736R VHF/UHF Base-Station Transceiver

The FT-736R is Yaesu's best VHF/UHF transceiver! Designed for the serious VHF/UHF operator, this high-performance transceiver provides 25W output (SSB, CW, FM) on the 2 metre and 70cm (430-450MHz) bands and can easily be expanded to cover the 6 metre and 23cm (1240-1300MHz) bands as required. Features include keyboard frequency entry, 115 memories, 2 independent VFOs per band, separate FM Channel knob with selectable channels steps, 2 full duplex VFOs for Satellite operation, IF shift and Notch filters, noise blanker, all-mode VOX, SSB speech processor, GaAs Fet front-ends(430, 1200MHz) high-stability TCXO reference oscillator & an inbuilt AC power supply. Microphone optional extra.

Cat D-2920

2 Year warranty

HURRY! BEAT THE PRICE RISE! **$2995**

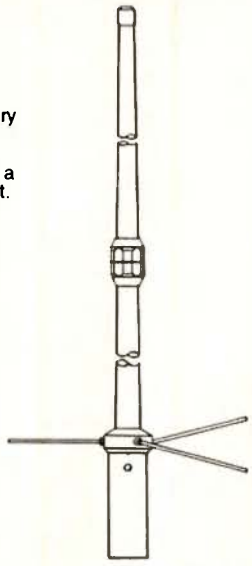
FT-911 23cm Handheld

The compact FT-911 23cm hand-held provides great performance, long battery life, and rugged construction, at an incredibly low Dick Smith Electronics price. If you've been thinking of getting a 23cm hand-held, now's the time to do it. The FT-911 provides 1240-1300MHz coverage, 2 VFO's, keypad frequency entry, 7-digit LCD screen, 1000 mA/H NiCad pack, carry case, belt-clip and approved AC charger.
Cat D-3380

Only $599

Save $200

2 Year Warranty



BRAINER

Hurry, these Brainer Antenna specials expire 31st December '93. Buy now and save!

Quality Japanese antennas at a bargain price. Don't miss out on these great specials, exclusive to Dick Smith Electronics!

A Price Breakthrough!

Don't miss our best ever prices on these high performance Brainer dualband 2m/70cm base station antennas. They use robust FRP (fibreglass reinforced polyester) tubing construction for excellent all-weather operation, and a ground-plane for a clean low-angle radiation pattern which maximises gain. Each antenna is rated at 200W, uses stainless steel hardware for long-life, and comes with detailed locally written instructions to make construction easy.

Compact GST-1 2m/70cm Antenna

SAVE $20

Frequency	144-148MHz, 430-450MHz
Gain	6dB on 2m, 8dB on 70cm
Length	2.5m
Type	2 x 5/8 wave (2m) 4 x 5/8 wave (70cm)

Cat D-4830

$179

Long Range GST-3 2m/70cm Antenna

SAVE $10

Frequency	144-148MHz, 430-440MHz
Gain	7.9dB on 2m, 11.7dB on 70cm
Length	4.4m
Type	3 x 5/8 wave (2m) 7 x 5/8 wave (70 cm)

Cat D-4835

$269

FT-2400H Rugged 2m 50W Mobile

Our toughest 2m mobile! The FT-2400H is the first 2m amateur ric to meet the USA MIL-STD 810C shock and vibration requirements, so you know you're getting a transceiver that will provide really reliable long-term operation. It's one-piece diecast chassis allows 50W output without forced air cooling, while the large back-lit LCD screen and major controls are well spaced for easy access. A customised microprocessor also provides Auto Repeater Shift (Australian band plan), plus extended 140-174MHz receiver coverage with a track-tuned front-end and dual FET mixer for improved receiver performance. CTCSS encode, 31 tunable memories, scanning modes, and an MH-26 hand microphone are also provided.

Cat D-3630

$699

2 Year Warranty

PHONE, FAX & MAILORDER SERVICE & YAESU BROCHURE HOTLINE
Outside Sydney (FREE Call) 008 22 6610
Sydney and Enquiries - (02) 888 2105
Fax: (02) 805 1986 or write to
Dick Smith Electronics, Mail Orders, Reply Paid 160
PO Box 321 NORTH RYDE NSW 2113
All major Credit Cards accepted. O/Nite Courier Available.
Yaesu stocks and some antennas not held at all stores, please contact your local store for availability, or phone 008 22 6610

B 1619

DICK SMITH ELECTRONICS

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 871 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 8822 • Kotara 56 2092 • Liverpool 600 9888 • Maitland 33 7666 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney (Greenwood Plaza) 964 9467 • Orange 618 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 ACT • Belconnen (06) 253 1785 • Fyshwick 280 4944 VIC • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Frankston 783 9144 • Geelong 232 711 • Highpoint 318 6300 • Melbourne City 399 Elizabeth St 326 6088 & 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0522 QLD • Booval 282 6200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 6255 • Maroochydore 791 800 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 SA • Adelaide City 232 1200 • Elizabeth 255 6099 • Enfield 260 6088• St Marys 277 8977 • Westlakes 235 1244 WA • Cannington 451 8666 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 TAS • Hobart 31 0800 • Launceston 344 555 NT • Darwin 81 1977
STORES ACROSS AUSTRALIA AND NEW ZEALAND *STORES IN RED ARE OPEN SUNDAYS.

Contests

*P Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Dec 93 — Feb 94		
Dec 3/5	ARRL 160 m Contest	(Nov 93)
Dec 11/12	ARRL 10 m Contest	(Nov 93)
Dec 26/		
Jan 16	WIA Ross Hull Memorial Contest	
Jan 1	ARRL Straight Key Night	
Jan 1/2	ARRL RTTY Roundup	
Jan 15/16	VHF/UHF Field Day	
Jan 16	HA DX CW Contest	
Jan 28/30	CQ WW 160 m DX Contest	
Jan 29/30	UBA (Belgium) SSB DX Contest	
Feb 12/13	PACC CW/SSB DX Contest	
Feb 12/13	Spanish RTTY Contest	
Feb 19/20	ARRL DX CW Contest	
Feb 25/27	CQ 160 Metre SSB Contest	
Feb 26/27	RSGB 7 MHz CW Contest	
Feb 26/27	UBA (Belgium) CW DX Contest	

Introductory comments are held over this month, due to lack of space. Many thanks to the following for help, information, and inspiration: VK3KWA, VK6NE, CQ, QST, and Radio Communications. Please keep the letters coming, including any spare copies of results. I would like to wish everyone a very Happy Christmas, and see you all in the new year. Until then, good contesting!

73,
Peter VK3APN

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in the April issue of *Amateur Radio.*

ARRL Straight Key Night

This is a yearly activity period for stations using a straight key, and runs from 0000 to 2359z on New Year's Day, Saturday, 1 January. Suggested frequencies on 80, 40 and 20 metres are 60-80 kHz up from the band edge.

Use "SKN" instead of RST in the exchange, to indicate to other stations you are using a straight key. This is not a contest, serial numbers are not exchanged, and ragchewing is encouraged. Send a list of stations worked plus your vote for best fist heard, most interesting contact etc, by January 8th to: "ARRL SKN", 225 Main Street, Newington, CT, USA 06111.

ARRL RTTY Roundup

1800z Saturday to 2400z Sunday, Jan 1-2.

The object is to contact as many local and overseas stations as possible on Baudot, RTTY, ASCII, AMTOR, and/or packet. More than one digital mode may be used, but QSOs and multipliers are counted once only regardless of mode. The bands allowed are 3.5-30 MHz, on frequencies recommended for digital operation (no 10, 18 or 24 MHz). Categories are: single operator all band (1) max 150 W O/P, (2) more than 150 W O/P; multi-operator single transmitter all band.

Exchange signal report and QSO number. W/VE stations will send signal report and state/province. A maximum of 24 hours operating time is permitted out of the 30 hour contest period. Two rest periods must be taken in two separate blocks, and the on and off times clearly marked in the log. Each rest period must be at least 15 minutes. Listening time counts as operating time.

Score 1 point per QSO. A station may be worked once per band for points credit. The multiplier is the total of the US states, Canadian provinces, and DXCC countries worked. KH6 and KL7 are countries; VO1 & VO2 count as one VE province. Multipliers are counted only once, not once per band. The final score is the total points times the multiplier. Check sheets are required for logs with 200+ QSOs. Mail your log and summary sheet by 2 February to: "ARRL RTTY Roundup", 225 Main Street, Newington, CT, USA 06111.

HA DX CW Contest

0000-2400z Sunday 16 January

This contest takes place on the Sunday of the 3rd full weekend of January each year. Categories are: single operator single or multiband, multioperator single or multitransmitter, and SWL. Bands are 160-10 m. Exchange RST + serial number; HA/HG stations will add a 2 letter county code, or if members of HADXC, their club number. Codes for each call area are (1) GY VA ZA, (2) KO VE, (3) SO TO BA, (4) FE, (5) BP, (6) NG HE, (7) PE SZ, (8) BN BE CS, (9) BO, (0) HA SA.

Score 6 points per HA/HG QSO. Multipliers are the total HA counties and club numbers worked per band. Final score equals total points x total multiplier. Separate logs for each band are requested. Send logs with summary sheet and declaration within 6 weeks to "HADXC, PO Box 79, Paks. H-7031, Hungary". Comprehensive awards are offered, and the top foreign single operator multiband entrant will be awarded honorary membership of HADXC.

CQ Worldwide 160 Metre Contest

2200z Friday to 1600z Sunday.

CW: 28-30 Jan; Phone: 25-27 Feb

The CW and Phone sections of this contest are scheduled for the last full weekend of Jan and Feb each year. The object is to contact as many stations worldwide on 160 m as possible, and VK to VK contacts are permitted for contest credit. Categories are single and multioperator. The use of packet, a spotting net, or logging assistant makes you multi-op. Suggested DX calling frequencies are 1830-1835; for W/VE QSOs specify a listening frequency outside this window. Look for Japan on 1907-1912.

Exchange RS(T) plus prefix or country abbreviation (W/VE will send RST plus state/province). Score 2 points for contacts with stations in own country, 5 points with stations in other countries in the same continent (continental boundary as for WAC), and 10 points with stations in other WAC continents. Points for contacts with /MM stations depend on their location.

Multipliers are US states (max 48, KH6 & KL7 not included); Canadian provinces (max 13, including VO1, VO2, NB, NS, PEI, VE2, VE3, VE4, VE5, VE6, VE7, NWT, Yukon); DXCC/WAE countries, including KH6 and KL7; maritime mobiles. The final score equals the total QSO points times total multiplier (US states + VE provinces + DX countries + maritime mobiles).

Check sheets are required for logs containing 200+ QSOs (no small feat in VK!). Computer disk logs are especially welcome. Indicate CW or SSB on the envelope, and mail the log and paper summary sheet to: "CQ 160 Metre Contest, 76 North Broadway, Hicksville, NY 11801". Mailing deadlines are 28 Feb for CW, and 31 March for SSB.

Ross Hull Memorial VHF-UHF Contest 1993-1994

The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF-UHF field, especially the discovery and investigation of VHF tropospheric propagation. The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Other certificates may be awarded to top scorers in the various divisions of the contest. The contest is not confined to WIA members.

Duration:

Although this contest normally begins on the first Saturday after Christmas Day, this year Christmas Day is on Saturday, so it will begin on Boxing Day. The

duration is therefore 1800 UTC Sunday, 26 December 1993, to 1800 UTC Sunday, 16 January 1994.

The 1800 UTC start for contest days has been retained, so each contest day will start early in the morning local time, eg 5 am Eastern Summer Time. Logs must show time in UTC, but local dates may be used. Note that the last weekend of the contest coincides with the VHF/UHF Field Day, and contacts made in one contest may be claimed for either or both, as applicable.

Sections:

Single operator only, (A) multiband, (B) single band. All entrants will be scored for both sections (A) and (B).

General:

All bands above 30 MHz may be used. On 6 m, a lower limit of 50.125 MHz is suggested for contest activity, and 52-54 MHz for local contacts. NOTE: NO contest operation should take place near 50.110 MHz, and offenders will be disqualified.

Contest exchanges should not be made on recognised DX calling frequencies, unless conditions make it impossible to move elsewhere, as the idea of the contest is to work DX which no-one can do if the calling frequency is full of S9 local signals! A frequency of .150 on each band is suggested for contest calls.

Stations may be worked once per band per contest day. Crossband, repeater or satellite contacts are not permitted. You may operate from any location.

Contest Exchange:

RS(T) plus a 3-digit serial number, which may be cumulative or revert to 001 at the start of each contest day. Maidenhead locators may also be exchanged to assist distance calculations.

Scoring:

Scoring is determined from the 7 best contest days (1800-1800 UTC) for each band, as nominated by the entrant. The days may be different for each band.

For contacts on these days only, claim 1 point per 100 km or part thereof (ie up to 99 km, 1 point; 100-199 km, 2 points, etc). On 6 m, a maximum of 10 points per contact applies. Multiply the total points on each band by the multiplier for that band, which is: 6 m (1), 2 m (4), 70 cm (7), 23 cm (10), 13 cm (13), Higher (16).

Logs:

Logs should cover the full contest period. Distance estimates need only be made for the 7 nominated days for each band. Separate logs for each band are not necessary but, if possible, common logs should have a separate score column for each band.

For each contact, show:
— date and UTC time;
– your location (if portable/mobile);
— band, mode, and callsign of station worked;
— location or Maidenhead locator of station worked (if not QTHR);
— RS(T) and serial numbers sent and received;
— estimated distance and points claimed.

Logs must include a cover sheet showing: operator's callsign, name and address, station location (if different from the postal address), a scoring table set out as per the example below, and a signed declaration that the station has been operated in accordance with the rules and spirit of the contest.

Deadline:

Post logs to: "John Martin VK3KWA, WIA Ross Hull Contest Manager, PO Box 300, Caulfield South, Vic 3162" to be received by Monday, 7 February 1994. Early logs would be appreciated.

Disqualification:

Normal rules apply. Entrants may be disqualified if there is evidence that claimed contacts were not made, or if logs are incomplete or illegible. Persistent use of DX calling frequencies for contest exchanges may lead to disqualification.

Awards:

The overall winner will be the top scorer in Section (A). Awards will also be made to the top scorers on each of the following bands: 6 m; 2 m; 70 cm; 23 cm; 13 cm; microwave (bands above 3 GHz).

Example Scoring Table:

6 metres		2 metres		70 cm		
Date	Score	Date	Score	Date	Score	
Dec 29	xxx	Dec 27	xxx	Dec 29	xxx	
Jan 7	xxx	Dec 31	xxx	Jan 6	xxx	
Jan 10	xxx	Jan 6	xxx	Jan 9	xxx	
etc up to 7th nominated day for each band						
Points	xxx		xxx		xxx	
Mult	x 1		x 4		x 7	
Total	xxx	+	xxx	+	xxx	= xxxx
						(GRAND TOTAL)

Note on Calculating Distances:

Absolute accuracy is not needed, providing you know whether the distance is above or below the nearest multiple of 100 km. An easy method is to draw 100 km circles around your location on a map with a compass. Better estimates can be made from 6-digit Maidenhead locators, using the simple computer programs published in the Dec 90 and Jan 91 editions of *Amateur Radio.* An accurate and fully error-trapped program on IBM format floppy disc is available from: John Martin VK3KWA (QTHR), upon receipt of a disc (any size) in a mailing box plus return postage. This program also includes calculation of bearings and conversion between lat/long and Maidenhead locators.

Note that the contest manager reserves the right to adjust claimed distances on the basis of computer calculation, and his decision is final.

As usual, good luck and good DX to all — and please send in that log!

1994 VHF-UHF Field Day

The Field Day will again be run over the last weekend of the Ross Hull Contest — 15/16 January 1994. The time differential between VK6 and the eastern states has been retained.

Field Day contacts can be counted for the Ross Hull Contest, and vice versa. Separate exchanges for the two are NOT required. The only difference in the exchange is that the Field Day exchange must include your Maidenhead locator. The other thing to remember is that you can make repeat contacts for the Field Day but not for the Ross Hull Contest.

The duration of the Field Day has been extended, although scoring will still be based on a 24-hour or 6-hour operating period. This allows entrants to choose the operating periods that suit them best, and will also make it easier for those who can only operate on the Sunday. The repeat

contact time has been reduced from four hours to three.

The only other change has been to drop the requirement for all operation to be from the one locator square. Entrants can now, if they wish, activate different squares on the two days of the Field Day, and help others to collect new squares for the WIA Grid Square Award.

Duration:

VK6 only: 0200 UTC Saturday, 15 January to 0600 UTC Sunday, 16 January. All other call areas: 0000 UTC Saturday to 0400 UTC Sunday (in Eastern Summer Time this is 11 am Saturday to 3 pm Sunday).

Sections:

A: Portable station, single operator, any 24 consecutive hours.

B: Portable station, single operator, any 6 consecutive hours.

C: Portable station, multiple operator, any 24 consecutive hours. D: Home station, any 24 consecutive hours.

Single operator stations may enter both Section A and Section B.

General Rules:

All modes and bands above 30 MHz may be used. Contest exchanges should not be made on recognised DX calling frequencies. Repeater, satellite and crossband contacts are not allowed. Operation may be from any location. You may work stations within your own locator square.

Contest Exchange:

RS(T) plus a 3-digit serial number (serial numbers need not be consecutive), plus your Maidenhead locator.

Repeat Contacts:

Stations may be worked again on each band after three hours.

Scoring:

Home stations 1 point per contact, portable stations 2 points per contact. Band multipliers: 6 m (1), 2 m (4), 70 cm (7), 23 cm (10), 13 cm (13), Higher (16).

For each band, multiply the total points (either 1 or 2 points per contact) by the number of locator squares worked on that band, then by the appropriate band multiplier. For example, on 2 metres, 20 points x 4 squares x 4 = 320 points. See the sample scoring table below.

Logs:

For each contact: UTC time, band, station worked, serial numbers and locator numbers exchanged, points claimed. The front sheet should contain name, address, callsign, section entered, the period of operation to be scored (either 24 or 6 consecutive hours, starting on the hour), and a scoring table as shown below. If you enter both the 24 and 6 hour sections, a separate scoring table should be supplied for each.

The scoring table should be as follows:

Band	Points		Squares		Multiplier		Total
6 m	xxxx	x	xxxx	x	1	=	xxxx
2 m	xxxx	x	xxxx	x	4	=	xxxx
70 cm	xxxx	x	xxxx	x	7	=	xxxx
etc.					Overall Total:		xxxx

Entries:

Post logs to: "John Martin VK3KWA, VHF-UHF Field Day Contest Manager, PO Box 300, Caulfield South, Vic 3162". Logs must be received by Monday, 7 February 1994. Early logs would be appreciated.

Awards:

The overall winner will be the highest all-band scorer in Section A. Awards will also be made to the highest scorer on each band in Section A, and the highest scorers in Sections B, C and D.

Results (Oceania) of RSGB 1993 7 MHz DX Contest

Call/QSO Pts/Mult/Score (* = award winner)

VK3APN* 420 12 5400
VK8AV 260 8 2080

Results of 1993 WIA RD Contest

Congratulations to VK3 Division, who have won the RD Trophy yet again, and the runner-up VK6 Division. No doubt there will be mutterings about the need for a rule change to even out the results, but be assured the formula rewards the divisions which participate well!

Perhaps driven by the poor HF conditions, 2 divisions turned to VHF and scored well. Perhaps amateurs in the other divisions might consider including VHF in their activity for next year's contest. Remember, it's only 8 months away!

This year's results were again compiled by the Northern Corridor Radio Group, whose assistance allows a timely result to appear in *Amateur Radio.*

73, Neil VK6NE

Divisional Ladder:

$$\text{Final Score} = \frac{\text{No. Logs}}{\text{No. Licences}} \times \text{Total points} \times \text{WF}$$

1st: VK3 (180/4863 x 16491 x 3.631 = 2216.47)
2nd: VK6 (119/1681 x 12026 x 1.353 = 1151.43)
3rd: VK2 (42/5325 x 4613 x 11.507 = 418.68)
4th: VK5 (55/1999 x 5806 x 2.565 = 409.72)
5th: VK1 (37/421 x 2602 x 1.718 = 392.92)
6th: VK4 (34/3284 x 3433 x 9.546 = 339.28)
7th: VK7 (17/627 x 2478 x 4.723 = 317.31)

Individual Results

* denotes a certificate winner
\# denotes a certificate winner (Novice class)

HF Phone:

VK1HK	207	VK3PK	67	VK4AAK	50
VK1RN	101	VK3EXV	66	VK4WRM	50
VK1LEC	82	VK3MFX	65	VK4AVR	42
VK1DA	66	VK3EUZ	62	VK4PJ	35
VK1KLB	63	VK3AFW	60	VK4CD	25
VK1BRD	45	VK3EZM	58	VK4ACC	23
VK1DW	35	VK3AHD	51	VK4ADY	16
VK1ZX	16	VK3ATL/P	45	VK5AYD	512
VK1OK	12	VK3DXH	45	VK5ARC	426
VK1MTB	11	VK3WOD	44	VK5ATU	387
VK2ARJ	598	VK3DY	42	VK5EE	251
VK2BO	502	VK3VEX	41	VK5GN	250
VK2CAA/P	413	VK3SM	40	VK5BWH	217
VK2CJH	317	VK3MGZ	40	VK5NYD	176 #
VK2CCK	292	VK3BMV	40	VK5FD	155
VK2PS	289	VK3XK	39	VK5XY	150
VK2VM	259	VK3LBA	38	VK5DK	100
VK2SS	137	VK3JDO	35	VK5UW	100
VK2XT	122	VK3NAH	33	VK5EW	84
VK2CJT	120	VK3CHN	33	VK5PAY	81
VK2ALZ	105	VK3DYF	33	VK5WO	74
VK2IKV	104	VK3PQ	32	VK5LL	72
VK2DQE	95	VK3LP	30	VK5BVJ	70
VK2ANK	88	VK3QI	30	VK5GMH	58
VK2RX	79	VK3WEQ	30	VK5YX	54
VK2IV	73	VK3EWD	27	VK5ZQ	51
VK2RJ	58	VK3JJF	26	VK5RV	50
VK2LEE	52	VK3AGH	25	VK5NF	45
VK2SP	43	VK3AXJ	25	VK5APC	43
VK2WG/P	35	VK3DKT	25	VK5RK	42
VK2AXT	31	VK3NA	24	VK5UQ	35
VK2DJW	27	VK3PA	23	VK5TW	35
VK2EMU	27	VK3DD	21	VK5PC	34
VK2MV	27	VK3BFN	21	VK5AGB	30
VK2KGX	22	VK3UJ	20	VK5CJ	25
VK2CF	20	VK3JI	20	VK5BGL	24
VK2ALV	13	VK3KAV	20	VK5KJT	22
VK2WT	11	VK3AYQ	20	VK5XT	21
VK3YH	417	VK3EAT	19	VK5KRT	17
VK3BML	284	VK3VTR	17	VK5SE	16
VK3DDX	271	VK3DYL	17	VI6CKB	632*
VK3APC	211	VK3IP	17	VK6UF	473
VK3AHY	194	VK3ALD	15	VK6ED	450
VK3CX	164	VK3VCF	15	VK6ANC	319
VK3EJS	156	VK3ACR	11	VK6WJH	309
VK3GH	154	VK3KKJ	4	VK6RG	225
VK3GHA	138	VK4DDJ	343	VK6GW	222
VK3HG	124	VK4BAY	333	VK6KG	168
VK3ABP	122	VK4LT	217	VK6IM	166
VK3ALK	118	VK4DRC	205	VK6JP	154
VK3MBR	111	VK4IS	203	VK6PAK	150
VK3ADW	102	VK4BBA	201	VK6SMH	121
VK3JK	101	VK4AMD	191	VK6KH	114
VK3DVT	101	VK4GD	110	VK6HU	105
VK3CKH	100	VK4ACW	105	VK6SAN	105
VK3CSD	98	VK4KEL	102	VK6OE	103
VK3CAY	96	VK4OF	101	VK6VZ	100
VK3BJN	95	VK4AQD	82	VK6SAR	82
VK3OM	94	VK4OD	80	VK6RR	79
VK3XF	92	VK4KJD	76	VK6SCS	75
VK3DNC	84	VK4YG	75	VK6SH	74
VK3LK	79	VK4CEM	71	VK6ABC	67
VK3BRZ	79	VK4WIT/P	61	VK6SAA	57
VK3MTA	75	VK4BSH	60	VK6DA	56
VK3RC	74	VK4PVH/P	56	VK6GGA	46
VK3GI	72	VK4ACS	50	VK6PDR	44
		VK4PT	50	VK6YY	42

VK6QN	41	VK3DXH	11	VK3ER	163	VK5ZLJ	341	VK6RO	100	VK7GL	26
VK6FRE	40	VK3WEG	9	VK3WWW	158	VK5XY	153	VK6IM	90		
VK6RU	38	VK4XA*	134	VK3JK	155	VK5ZBK	140	VK6AN	87	VHFCW:	
VK6AN	38	VK4XW	116	VK3AXJ	151	VK5KRT	104	VK6HU	87	VK1DO	13*
VK6KAD	37	VK4LV	100	VK3XEM	149	VK5EW	98	VK6SAN	86	VK1DA	10
VK6GGD	37	VK4OD	45	VK3BMV	140	VK5PC	93	VK6RR	74		
VK6CR	33	VK4ICU	18	VK3GH	139	VK5THA	83	VK6ZSB	63	VHF Digital:	
VK6WU	31	VK4XJ	12	VK3AUI	135	VK5SE	78	VK6KIP	63	VK1ZX	6
VK6YJ	28	VK5AGX	97	VK3IP	133	VK5ZKK	71	VK6JJ	55	VK3KKS	13
VK6TS	25	VK5BGL	46	VK3EWM	133	VK5ZDS	70	VK6OE	53	VK3ACR	11
VK6UW	23	VK5TL	25	VK3MTA	127	VK5ZTJ	66	VK6KG	52	VK3CAY	1
VK6WT	20	VK5XE	19	VK3ZNF	122	VK5GN	57	VK6CR	50	VK6KS	50*
VK6APK	20	VK5AAC	19	VK3MCL	115	VK5UQ	24	VK6FC	49	VK6XPS	42 #
VK6APW	18	VK6AFW	94	VK3TJA	115	VK5IE	24	VK6THB	42	VK6CR	17
VK6AO	17	VK6AJ	44	VK3KT	113	VK5PAY	21	VK6WCC	42	VK6RR	12
VK6FC	16	VK6WT	32	VK3ZWI	113	VK5YX	14	VK6APW	41	VK6THB	10
VK6QB	13	VK6VZ	22	VK3ZNE	111	VK6YS	563	VK6FJA	40	VK6HK	2
VK6HK	11	VK6RZ	15	VK3DUQ	109	VK6KS	500	VK6BY	38		
VK6YF	11	VK6RU	14	VK3XV	102	VK6WIA	289	VK6GSB	37	**Overseas Phone HF:**	
VK7PC	486	VK6GA	13	VK3MGZ	99	VK6TTY	287	VK6YF	35	P29VH	217*
VK7KZ	450	VK7RY	50	VK3GMZ	97	VK6RRG	273	VK6KW	33	P29NJS	56
VK7CK	385	VK7KA	35	VK3QI	97	VK6ZLZ	265	VK6DUN	32	ZL1BVK	389*
VK7KC	277	VK8HA	70	VK3USC	94	VK6ISY	259	VK6WT	30	ZL1BGT	222
VK7SHV	276	VK8AV	65	VK3XEC	82	VK6SH	240	VK6SM	26	ZL3TX	184
VK7MGS	152	**VHF Phone:**		VK3ARP	78	VK6LZ	237	VK6WU	26	ZL2ADN	170
VK7AL	88	VK1DO	272	VK3BML	73	VK6BWI	221	VK6MCB	23	ZL2GJ	161
VK7JP	68	VK1TRT	204	VK3CAY	71	VK6RG	218	VK6APK	21	ZL2AJB	122
VK7VK	56	VK1AWH	142	VK3CRA	68	VK6SAA	218	VK6UV	20		
VK7YW	56	VK1RG	133	VK3TQC	62	VK6XPS	212	VK6EB	18	**Overseas CW HF:**	
VK7NBF	20	VK1ZQR	133	VK3BFN	61	VK6GGA	199	VK6BDO	17	ZL4GU	84*
VK7NGC	20	VK1KLB	126	VK3CHN	60	VK6GGD	190	VK6AO	14	ZL2AJB	55
VK7BM	20	VK1KMA	120	VK3JJF	55	VK6SP	177	VK6HK	13		
VK7ASN	13	VK1DA	115	VK3PQ	55	VK6TKR	176	VK6RU	12	**Receiving:**	
VK6AN	270	VK1ED	92	VK3UFC	55	VK6DX	147	VK6FRE	12	VK6-	
HF CW:		VK1ZX	88	VK3ARK	50	VK6BDS	129	VK6RZ	10	P. Kenyon	242*
VK1FF	82	VK1DW	85	VK3CSD	45	VK6SAR	107	VK6SM	8	VK3-	
VK1DRL	58	VK1LEC	69	VK3WI	43	VK6ANC	105	VK6ATR	6	M. Berglund	215
VK1CC	14	VK1WI	41	VK3HZ	41	VK6PDR	104	VK6SCS	3	L30763	65
VK1DA	14	VK2EDA/1	34	VK3JI	40						ar
VK2ZC	105	VK1YYZ	27	VK3DYL	39						
VK2AJE	102	VK1ACA	23	VK3DKT	32						
VK2DID	79	VK1BRD	22	VK3AMD	30						
VK2GS	76	VK1MTB	20	VK3AQ	30						
VK2II	71	VK1CUB	11	VK3XDQ	30						
VK2CW	52	VK1OK	10	VK3ZUG	30						
VK2QF	50	VK2ANK	62	VK3ZUQ	30						
VK2AZR	40	VK3ACR	864*	VK3AGH	28						
VK2AIC	38	VK3APC	491	VK3AFW	28						
VK2RJ	31	VK3AYF	436	VK3ZBI	28						
VK2DJW	30	VK3CKH	412	VK3AL	27						
VK2HQ	25	VK3BY	404	VK3BRZ	25						
VK2BO	23	VK3JDO	316	VK3ZXY	24						
VK3DVW	92	VK3ACT	288	VK3KKJ	22						
VK3FC	83	VK3DXH	273	VK3BJN	21						
VK3CIM	68	VK3WOD	272	VK3DTR	21						
VK3AMD	53	VK3CL	270	VK3VKC	21						
VK3XB	50	VK3JUD	261	VK3CX	20						
VK3ALZ	44	VK3ZJF	261	VK3DD	19						
VK3ANJ	40	VK3ALM	241	VK3BBU/P	19						
VK3APN	31	VK3JTA	234	VK3GI	17						
VK3NAH	30 #	VK3NJE	200	VK3YPY	16						
VK3XF	30	VK3GHA	184	VK3LBA	13						
VK3BBN	27	VK3WEG	177	VK3PC	13						
VK3DDX	26	VK3JTW	177	VK3MFX	10						
VK3DNC	20	VK3ANM	175	VK3ZB	10						
VK3KS	18	VK3VKP	173	VK3EAT	2						
VK3JI	16	VK3MFR	171	VK5TTY	494 #						

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make: Alinco

Model: DJ-100T

Serial Number: 0005049

Type: Handheld transceiver

Accessories: Rubber duck antennna; battery pack

Modifications: Callsign VK2KIQ painted on body

Stolen from: JOTA base at 3rd Mortdale Scout Hall

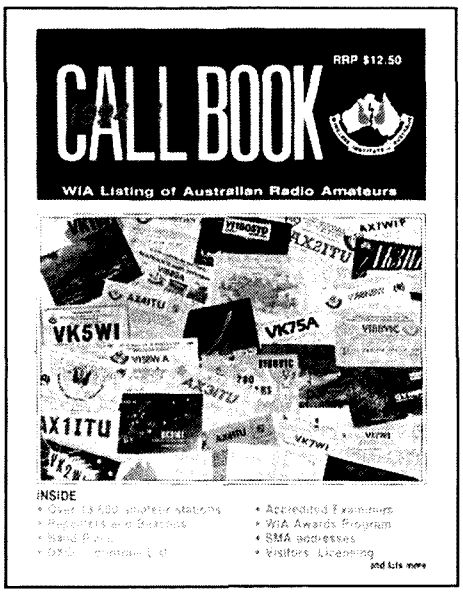
Date: 17 October 1993

Owner: Doug Rosser

Callsign: VK2KIQ

Contact details: 02 411 9611 BH ar

IDEAL CHRISTMAS PRESENT
1994 Australian Call Book



Over 18,500 Up-to-date Callsign Listings

Over 500 Shortwave Listener Listings

Australian Repeater Directory

Australian Beacon Listings

Comprehensive Australian Band Plans

Complete DXCC Countries List

And much more, such as Australian TV Frequencies, QSL Bureaux, Slow Morse Transmissions, Accredited Examiners List, Repeater Guidelines, WIA Awards, Australian VHF/UHF Records, New Zealand Repeaters and Beacons, International Callsign Series, and so on.

LIMITED STOCK!
SELLING FAST!

Buy your copy NOW from your WIA Divisional Bookshop.

Cover price $12.50
Special price to WIA Members $11.00, plus Postage and Handling where applicable

Divisional Notes

Forward Bias — News from the VK1 Division

Christopher VK1DO

Canberra has been turning on its usual charming, warm weather over the last month. This pleasant weather, combined with daylight saving, is an ideal time to see antenna projects completed and vital refurbishing of those outdoor components that wear and tear.

Many of our local amateurs assisted with communications during the recent Esanda car rally. This spectacle dominated the dirt roads around our local forests for three days during November. The meticulous organisation and levels of expertise exhibited in this exercise are a credit to the amateurs involved. Thanks are extended, not only to those directly involved, but also to the locals who allowed the exclusive use of our repeaters throughout the weekend.

Hot on the heels of the Esanda rally, in fact the next day, saw an enthusiastic group of locals meeting for the final event in the ACT Division's 1993 calendar, namely an end of year BBQ. While on the topic of our calendar and various schedules, please note, if you are an avid listener to our weekly broadcasts, that the broadcast will go into a Christmas recess with the last broadcast in December going to air on Monday 13 December. We return on Monday 17 January just one week before our January meeting.

I am pleased to say that we are still looking strong for our part in the 1994 John Moyle Field Day. Three groups are well advanced for operation during the weekend. The organisers for these three groups are John VK2EJC, Phillip VK1PJ and Christopher VK1DO. John's group plans to operate from a site just near Captains Flat. Phil will take his troops somewhere further south and the third group hopes to operate from Mt Franklin with an emphasis on VHF and some lickity split CW operators burning up the ether on HF. Please don't wait to be invited; speak up and get in on the remaining planning meetings before things are finalised.

The general meetings of 1993 have been well supplied with scintillating technical topics. I hope that a similar variety and standard can be kept on line for 1994. So far, I know of our January meeting actually having two topics planned. We hope to have some video footage of the January VHF/UHF field day with actual operation included. Another back-up topic is on line in reserve if circumstances prevent our newsreel type footage materialising.

Our February meeting is always well occupied with the interesting stuff of an AGM. However, it would be very helpful if our March, April and May meetings, at least, could be firmed up to assist the committee's planning and especially the long term promotion in both this column and our weekly broadcasts. If you have a topic or an idea for a meeting topic which needs some development, please speak up and we will give it every consideration and support to help maintain the last year's excellent standard.

I am delighted to say that already two local amateurs, relatively new to our division, have expressed their interest in standing for next year's committee. This extraordinary demonstration of enthusiasm is impressive particularly considering that I hadn't even subjected either of these volunteers to arm twisting or active lobbying. If this positive trend continues, the vigour and innovation within our committee will be mind blowing. I hope that more locals will follow their lead and contribute toward a spirited election next February.

Apart from the two remaining broadcasts on the sixth and thirteenth of this month, our calendar of events will have no more offerings until the new year. I hope that you are able to enjoy some of the summer break and improve your station, complete those top shelf projects and even do some operating. If you have six metres in your HF radio, why not build a beam and sample the incredible propagation during summer. If you are on VHF, I hope to work you both this month and next, particularly during the Ross Hull VHF/UHF contest that commences after Christmas. Novices should check the rules for a category in which they can compete with other novices. A worthwhile opportunity to do some hilltopping and get a taste of operation away from the repeaters.

In conclusion. Best wishes to all our local amateurs and their families. I hope you have a very merry Christmas and take it carefully if you are travelling, we want to see *you* again in 1994, which I trust will be a prosperous year for everyone.

VK3 Notes

Barry Wilton VK3XV

Christmas Holidays

The Victorian Division Office will close on 16 December 1993 and reopen on 8 February 1994. Membership applications received by post will be processed during this period.

The last Sunday broadcast for 1993 from VK3BWI will be on 19 December. The regular broadcast will resume on 23 January 1994. "For Sale" items will not be transmitted until the Division office reopens. News and information can be posted to the Broadcast Co-ordinator, 2 Alfred Street, Boronia 3155, or sent by fax on Thursdays only to 03 762 2559 between 1.30 pm and 3 pm.

Nominations for Council

Nominations for the 1994/95 Victorian Division Council close at noon on Friday 14 January 1994. Nominations will only be accepted on forms available from the Secretary.

Nomination forms must be obtained prior to the close of business on Thursday, December 16, 1993. Nominations may be returned by ordinary mail to the office, and will be processed during the holiday period.

Special Thanks

The Division Council extends a vote of thanks to those members who provided valuable assistance during the year with a special mention of the following -

Marilyn Syme VK3DMS, for her contribution to the broadcast and the WIA Victoria Club Net;

Len Vermuelen VK3COD, and Max Chatwick VK3WOD, for their assistance with disposals equipment; and

The VK3BWI team of announcers — VK3ENX, JWL, MET, PQ, BRN, BDL, CGT, AVY, ABQ, UV, DTR and EPD.

Repeater Linking

The repeater link between VK3RGL at Mt Anakie and VK3ROW at Beech Forest is now operative and providing an additional service for the Sunday Broadcast.

A 70 cm link receiver has been installed at VK3RNE and it was originally intended to provide a link from VK3RMU via VK3RDU at Mt Major. Site surveys have proved that our old repeater location at Chesney Vale provides a superior path for the intermediate link, and work is proceeding.

Ex President Injured

Alan Noble VK3BBM, a Past President of the Victorian Division, an ex Federal Councillor, and currently an active worker with the WICEN administration, was badly injured in a motor car accident in October. We wish him a speedy recovery and an early return to the hobby.

THE VICTORIAN DIVISION COUNCIL WISHES ALL MEMBERS A MERRY CHRISTMAS AND A PROSPEROUS NEW YEAR!

5/8 Wave — VK5 Notes

Rowland Bruce VK5OU

At the October General meeting, chaired by Garry VK5ZK, a straw poll was taken regarding the Christmas social. In recent years this has been held at the Woodville Community Centre, but despite some good entertainment to accompany the social side of things, the attendance has gradually decreased. It appears that a preferred option is to hold a function at the BGB headquarters and this has been arranged for the evening of 7 December. Listen to the broadcasts for details nearer the time, or talk to someone who has attended the November meeting.

Peter Koen reported on two successful events, the 36th JOTA and Leisure Day in the Park, and Lindsay Collins on Camp Quality. The topic for the night was the North East Radio Group 2 m Morse training beacon.

A tentative booking has been made for a residential Clubs Convention for the weekend of 27/28 February 1994. Is your Club, if you belong to one, planning to send representatives or delegates? If not, why not? This is the chance to "have a go" at the faceless persons who are so often taken to task for the decisions they make and to put ideas forward for consideration. There are twenty-four WIA affiliated groups which are entitled to be represented. Secretaries of clubs should have received letters from the WIA Secretary by now.

Printing difficulties have been overcome for the VK5WI QSL cards and, in particular, anyone awaiting a reply for the 10 m beacon should receive a card soon. Also, the WIA membership certificates have been despatched.

Finally, to the new members for this edition. Welcome to J Dunn, C McCarthy VK5EB, and J Hutchison VK5ZAI. To them, and to all amateurs everywhere, the President and Council of the VK5/VK8 Division wish a very happy and peaceful Christmas.

ar

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad.

Club Corner

ANARS Represents Australia

The contest season is in full swing. For several years during the weekend before Christmas the various naval/maritime amateur radio clubs have held the International Naval Contest. Any Australian station entering this contest has until now done so as a DX member of an overseas society.

This year is different.

For the first time members of the newly formed Australian Naval Amateur Radio Society will be operating under Australia's flag — putting Australia on the map in its own right!

Membership of the ANARS is open to all amateurs and SWLs who have a professional naval or maritime background.

Details can be obtained by checking into the Australian Naval Net on 3,620 kHz (+/– QRM) from 1000 hours UTC every Wednesday, or by contacting the Hon Secretary, Terry Clark VK2ALG, QTHR in the 1994 Callbook, or by phone at (060) 25 3292.

Raymond Island Convention

The WIA Eastern Zone Amateur Radio Club will be holding an amateur radio convention at A'Beckett Park on Raymond Island from 18-20 February 1994. A ferry ride from Paynesville takes you to a beautiful bush setting on the foreshore of the Gippsland Lakes.

The weekend is planned to cater for both amateurs and their families, with lots of different events and activities for both. There will be the usual trade displays, fox hunts, white elephant stalls, a computer swap and games, childrens' games, packet radio demonstration, radio throwing competition, and much more.

In addition to the above, it is planned to have a number of technical talks on a range of interesting topics.

Other activities available include swimming, canoeing, volleyball and table tennis, fishing, cycling, bushwalking and birdwatching.

A'Beckett Park is a camp retreat and, as such, accommodaton, if required, is provided in cabins with ensuite facilities. There is also provision for camping and caravans. Meals will be provided for those staying for the weekend and also for day visitors.

Registration forms will be included in next month's AR magazine. For any further information, please contact VK3PJ, VK3KME, VK3NMK or VK3AMR.

Chris VK3ME

ar

Technical Correspondence

Program for Coax Traps

I read with interest the article on Coax Traps by Paul Duff in the October issue of *Amateur Radio*. However, the BASIC programme on page 19 is sadly astray: in a couple of places "=" signs are used where there should be "+" signs and in another line the wrong variables are used.

I have taken the liberty of re-writing the programme in IBM compatible BASIC with the mathematics corrected and a couple of refinements of my own. A printout is attached.

```
10  CLS:PI=3.14159:INPUT"ENTER Former Dia. (inches): ",D
20  INPUT"ENTER Coax Dia.(inches): ";T
30  INPUT"ENTER Coax Capacitance (pF per foot): ",CC
40  INPUT"ENTER Desired Frequency (MHz.): ",X
50  FOR N=1 TO 50 STEP .25:L=(D+T)^2*N^2/(18*(D+T)+40*N*T)
60  C=CC*PI*N*(D+T)/12:F=1000/(2*PI*SQR(L*C)):IF F<=X THEN 80
70  NEXT N
80  CL=N*(D+T)*PI*2.54:CL=CINT(CL):PRINT
90  PRINT"number of Turns:";N:PRINT"Coax Length in coil:";CL;"cm.":PRINT
100 PRINT"Add 6 cm. for leads giving Coax Length required:";CL+6;"cm."
110 PRINT"D+T to N*T ratio:";(D+T)/(N*T)
120 END
```

John Fullagar VK3AVY
37 The Avenue
Ferntree Gully 3156

*(**Further comment.** Paul Duff agreed with John Fullagar that the original program contained errors. He has produced a corrected but much longer program with "bells and whistles". Unfortunately space does not permit its reproduction here but those interested may write direct to Paul for a copy. Ed.)*

EMC Report

*Hans Ruckert VK2AOU**

EMC the other way around!

The October 1993 issue of "CQ-DL" (the German sister magazine to *Amateur Radio*) reported that the Federal Parliament Secretary of the Ministry for Post & Communication, Dr Paul Laufs, had an interview with the DARC (the German sister society to the WIA) Manager, DB4DL BW Haefner, on unresolved matters of the new planned "Law on Amateur Radio Operation". The proposal, that 100 watts radiated power will become the maximum power radio amateurs will be permitted to use on VHF/UHF amateur bands, has caused quite a stir. The idea behind this yet-to-be released regulation seems to be the intention of the authorities to permit the use of frequencies near the amateur bands for miniature equipment, which is so small, that selectivity providing components are left out. This "lousy equipment" could be affected by legal amateur radio operation if more than 100 watts was used by radio amateurs. Financial considerations are behind this move.

10,000 EMC reports were issued by radio amateurs in Germany, complaining about interference from Channel 6 cable-TV transmissions, and/or from amateur radio signals getting into TV feeder cables with insufficient shielding. BAPT reported that only 5% (!) of the cable TV installations met the shielding requirements and regulations.

Digital Cellphones (submitted by DW Friend VK4OE) "New Science" on page 18 of the 7th August 1993 issue, reports on the EMC problems caused by the increasing use of digital communications methods. We radio amateurs are obliged to use only the narrowest possible frequency spectrum for our communication methods. CW signals must use rounded off pulses and key click filters to avoid generation of a wider than absolutely necessary spectrum; and phone transmissions must have means to limit the amplifier drive level with ALC circuits. Distorted sine waves like pulses are always formed by the fundamental pulse and a string of harmonics having a range of amplitudes. There is the danger that digital phone operation may cause interference to VHF amateur radio reception. Satellite communication, especially, could be affected, because extremely weak signals must be useable.

The three cases above show that amateur radio organisations must be watching those communication methods that directly or indirectly detrimentally affect our communication ability. There are powerful commercial interests involved, working on governments, who do not care about other frequency users.

EMC Radio-Communication, June & August 1993 (submitted by Norm Burton). Not only burglars, but also burglar alarms, are still a problem. Some alarms go off when a radio amateur transmits, whilst in other cases the alarm transmitted a signal near the 2 m band.

The "Vecta Key System" fitted to a car resulted in the following car RF immunity features — 10-80 MHz not less than 50 volt/m, modulated 99% with 1 kHz square waves. Similar results were achieved with transmissions at 30-200 MHz, and 200 MHz to 1 GHz, with an antenna mounted on the boot of the car, and radiating an RF power of not less than 100 watts.

It can be done! G8BQX reports how a helpful telephone company engineer solved the telephone RF breakthrough susceptibility reported by his neighbours, and found on his own phone. Radio amateurs who live in a block of flats have usually the worst EMC problems to face.

Attaching to my TV-set one of those wide-band untuned preamplifiers caused, as expected, TVI on all channels. However, adding also a good Telefunken highpass filter solved the problem, showing that amplifiers without selectivity should never be used. It is usually the community mast-head wideband preamplifier that lacks selectivity from 5 to 500 MHz that is to blame.

Fortunately these amplifiers are illegal in Germany. Every installation of a community preamplifier is checked by a radio inspector to ensure that it contains the necessary TV channel bandpass filters, and offers the required immunity.

G8MNY describes a 70 cm TVI filter and construction details. The likely problems caused by digital telephones are discussed. 15.625 MHz TV line timebase and switch mode power supplies radiation may travel along overhead power lines and cause interference to our shortwave reception. FAX equipment, VCRs, computers are also mentioned as interference sources, re-radiating via overhead power lines.

**25 Berrille Road Beverly Hills NSW 2209*

ar

Federal Technical Advisory Committee (FTAC) Notes

John Martin VK3KWA FTAC Chairman*

New Microwave Records

Interest in microwaves seems to be on the increase, due to the use of surplus tellurometers for wideband FM and Gasfet transverter kits for narrow band modes. The national 10 GHz record (set by VK3KAJ and VK3ZBJ in 1986) fell on 22 April to Roger Bowman VK5NY and Bill Pickering VK5ACY. Bill was operating from Minarapa, and Roger was by the roadside at the Cape Banks lighthouse, a distance of 355.4 km. I have heard a tape recording made by Roger of excellent SSB and noise-free FM signals from Bill. Congratulations. Two days later, Steve Hutcheon VK4ZSH and Neville Mills VK4KOP set a new 10 GHz ATV record, working over 144.3 km. Steve was portable in VK2, so this contact also means a new VK2 state record. Congratulations to Steve and Neville.

Beacons and FM Nets

In the Melbourne area there is a growing problem with FM nets and packet signals moving into the 144.400 — 144.600 MHz beacon band. The same may be happening in other parts of the country as well.

Distant beacons are quite audible to SSB/CW stations if there is no local QRM. FM receivers will not hear these beacons, so many FM operators may not realise that this part of the band is actually occupied. Unfortunately there are some who are aware that they are causing problems but choose to do nothing about it.

The 2 metre band plan allots 20 per cent of the band for weak signal work, beacons and satellites. FM and packet stations have the rest. That seems like a pretty fair go. If 80 per cent of the band isn't enough, it is time to think of other solutions.

Part of the problem is due to pager interference in the top end of the band, and part is due to a desire for a "private" net in what appears to be an unused part of the spectrum. Pager problems can often be cured just by switching to horizontal polarisation. Using SSB rather than FM would provide a greater operating range and allow far more stations to fit in the space available. If these options do not seem feasible then it is time to make more use of other bands where there is unused space, no pagers, and no need to clash with other people.

There are still plenty of unused FM channels on the 6 metre and 70 cm bands, and there is plenty of cheap surplus equipment available. The 23 cm band is ideal for local nets. When the new regulations come in, all licence classes except Novices will be able to use 29 MHz FM. With all these options available, it must be possible for us all to coexist quite happily and not tread on each other's corns.

Private nets are very handy but we must face the fact that their days on 2 metres are numbered. Taking up 25 kHz of the band for the sole use of maybe a dozen people is a powerfully inefficient use of spectrum space. The whole band could fill up with nothing but FM and people would still be looking for more. To FM operators I would say, please give thought to this. And to SSB/CW operators, when you monitor the beacon band and ask FM operators to keep it clear, please do it diplomatically.

*PO Box 300 Caulfield South VIC 3162

ar

WIA News

Contest Rules on Disk

The Contest Newsletter from the International Amateur Radio Union Region 1 Contests Sub-Group, received in the Federal Office recently, carried an appendix by way of a letter from Bernhard Koch OE4BKU, inviting every contest manager and organiser of HF contests to supply him with the latest contest rules.

His aim is to compile, and regularly update, a **world-wide contest database** holding details on all the HF contests around the world, to be available on computer disk. This work is being done under the auspices of the Austrian amateur radio society, OeVSV.

Contest information can be mailed to the OeVSV at:
Theresiengasse 11
A-1180 VIENNA
AUSTRIA
or faxed to 0222 403 1830.

It can also be sent directly to:
Bernhard Koch OE4BKU
Stoob-Sued 21
A-7350 Oberpuliendorf
AUSTRIA

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

Monitoring Service

I suspect many observers may think that, because the frequency they have patiently observed, has not been included in the summary of the month, their input is not of value.

Please dismiss that idea now!

All frequencies are painstakingly checked out, but maybe no one else has heard that intruder during the month. I keep track of these logs, but only those having the most information or comments, and heard the most often, are included in the summary. This is because these have the most chance of being further identified on a region basis or by the SMA who, being made up of public servants, have not the same time available as we do.

I do not have the time or facilities to include every logging in *Amateur Radio* (it would take up about 5 pages and be boring for most readers). It takes me about four hours to sift through the log sheets, which are roughly written out on a worksheet before I get around to the word-processor. I then sift again through all comments for possible inclusion to the IARU Region 3 co-ordinator.

For example, the September summary was compiled from 27 pages, a few double sided. I would be very pleased to have at least double this amount, so what about it those States not on my "mailing list"?

Remember, keep a pad handy alongside your mic or key, while looking for DX, to jot down intrusions which are worrying you. For goodness sake don't just complain to your contact about the intruder. Get him or her to put in a log to their respective co-ordinator as well.

Monitoring Service Update

"Action UMS" results are being processed. Approximately 12 member organisations had input.

A group of constant carriers have been consistently reported between 14020 and 14045 kHz. Any information on the likely source to the Monitoring Service please.

Numerous reports have also been coming in of pulsed signals in the lower end of the 17 m band. The pulse rate varies.

Readers are reminded that the 80 m band is shared as is 20 m above 14250 kHz.

Recent band conditions have not been very favourable for monitoring in Region 3. Our biggest constant offender is still the CIS group UMS, etc, and this may be due in a large part to the reported low angle radiation antenna complexes they use. Single letter beacons from CIS also feature constantly around 7039.5 kHz.

Intruder Watchers

I would appreciate it in future if your logs contained, as far as possible, your Maidenhead locator number, beam headings with observations, where possible, or direction of horizontal dipoles, along with, of course, signal strength, frequency, date, time (UTC) mode and ID if heard.

Reason? The SMA have decided to monitor our observations, as far as possible, in the same areas they have been reported from. Whatever our opinions are we must give them the chance to prove they are "fair dinkum".

*Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1

ar

Stop Press

First Australian 6 Metre EME Contacts

The Federal WIA has just received a fax from Steve Gregory VK3OT/VK3SIX of Hamilton, giving the following details:

On Sunday 7 November 1993 at 1539Z VK3OT and W6JKV (Los Altos Hill, CA) made a two way earth-moon-earth (EME) contact on CW. This is believed to be the first completed two way EME contact ever made from VK on 6 metres.

Less than an hour later (at 1625Z) Steve made contact with K6QXY at Glen Ellen CA, (some 100 miles north of San Francisco). The distances involved are 12,800 and 13,000 km. The contacts took place during the ARRL EME contest. Steve was running 1 kW CW (by special permit) into a 13 dBd 2.5 wavelength Yagi.

ar

Spotlight On SWLing

*Robin L Harwood VK7RH**

Amazingly another year has come to an end. We have seen quite a shake-up in programming and administration of various international radio stations over the past twelve months and it is going to continue in 1994. For example, the surrogate American clandestine broadcasters, "Radio Free Europe", and Radio Liberty ("Radio Svoboda"), based in Munich, are axing half of the programming staff by 1995, with the VOA assuming control and responsibility of technical operation, although editorial control will still remain in a reduced RFE/RL. It is also planned to move the RFE studios from Munich to Prague, in the Czech Republic. This move follows an assessment into the high cost of maintaining both Radio Free Europe and Radio Liberty, following the end of the Cold War and the alteration in political boundaries and governmental structures within Eastern Europe and the former Soviet Union.

As well, several language services are being scrapped or scaled back. For example, Hungarian and Afghan dialects have already been axed and Polish, Czech and Slovak are to have their hours reduced. Radio Liberty ("Radio Svoboda"), which broadcasts to the former Soviet Union, will continue for the present and be located in Munich.

Other broadcasters have been re-assessing their priorities and strategies into the next century. Radio Netherlands in Hilversum recently had a review of its operations and, although it is too early to speculate what will happen, there will nevertheless be changes. Deutsche Welle in Cologne, Germany, has also re-evaluated its strategies and targets, particularly since the re-unification of East and West. The Deutschlandfunk (DLF) which used to broadcast to European audiences has been absorbed into DW. DLF relied mainly on high powered MW senders and these have now reverted to broadcasting domestic programs similar to our own Radio National. As well,some language sessions will be cut back on shortwave, particularly to European audiences. Programming in Japanese and Dutch will be axed and broadcasts to Latin America will be reviewed.

The World Service of the "Christian Science Monitor" in Boston, Mass, has as well been forced to cut back on programming due to financial constraints. They had a large financial loss on their satellite and cable TV service which forced its closure. Also, the shortwave service has been cut back from a two hour block to one. There are two different segments, one a relay of their domestic service to American Public Radio, and the other is produced by their international service. The religious programming at weekends is produced by the Church and not by the "Monitor" and is separate from it. The transmitters and site in Maine, WCSN, is up for sale to the highest bidder to help fund the purchase of an extra 500 kW sender at the North Carolina site of WSHB.

And another piece of Australia's shortwave history reportedly comes to an end on 31 December when VLQ in Brisbane, which has relayed the ABC for over 50 years to the Outback, ceases on both 4920 and 9660 kHz. It is unclear at this stage whether VLW in Perth, which also has been on HF, will also join VLQ on the same date. Fortunately, the ABC Northern Territory Service will continue on 2 and 4 MHz. The senders located in Katherine and Alice Springs are shared with an aboriginal media service, while the Tennant Creek sender is exclusively running the ABC Territory Service.

I was disappointed to miss out on hearing the annual "Radio St Helena" shortwave test on 15 October but propagation ruled this out at this location. There were no signals present. Overseas reports indicate that some in Europe did hear it but only in spots. I also believe that next year, on 14 October it is said, that another broadcast may happen. I am sceptical at this stage.

It only remains for me to wish you and yours the very best for this festive Season and take care with your actions. A Happy Christmas and hope that 1994 will be saner and more peaceful than this year has been. All the best and hope your listening will bring you satisfaction in the future.

73

Robin L Harwood
**52 Connaught Crescent West Launceston TAS 7250*
VK7RH@VK7BBS

ar

Repeater Link

*Will McGhie VK6UU**

Extra Information

I received a packet message from Ron VK4BRG asking me to let you know that an article he presented in the October issue of *Amateur Radio* was not complete. The article appears on pages 10 and 11 and is a voice repeater control unit. Missing is information on programming the callsign, etc and a veroboard layout with construction notes. If you want this information Ron can make it available if you send him a medium size SASE plus a couple of 45 cent stamps to cover photo copying.

FM 828

Little did Philips know when they developed the FM 828 that it would become the back bone of the amateur repeater network. This radio is the one most used in our repeaters. There are several versions for VHF low band, high band and UHF. The circuitry is almost the same for the VHF low and high band. The UHF model has some similarities but largely is not the same.

I wrote to Philips and asked their permission to reproduce the VHF circuitry in *Amateur Radio* and they have agreed.

As the circuit is large and cannot fit on A4 size I have divided the receiver into 3 sections, front end, IF, and audio and mute. This month is the first drawing and shows the RF amplifier, crystal oscillators, frequency multiplier and mixer. Included in the drawings are typical voltages to be found. As an example 3V7 means 3.7 volts.

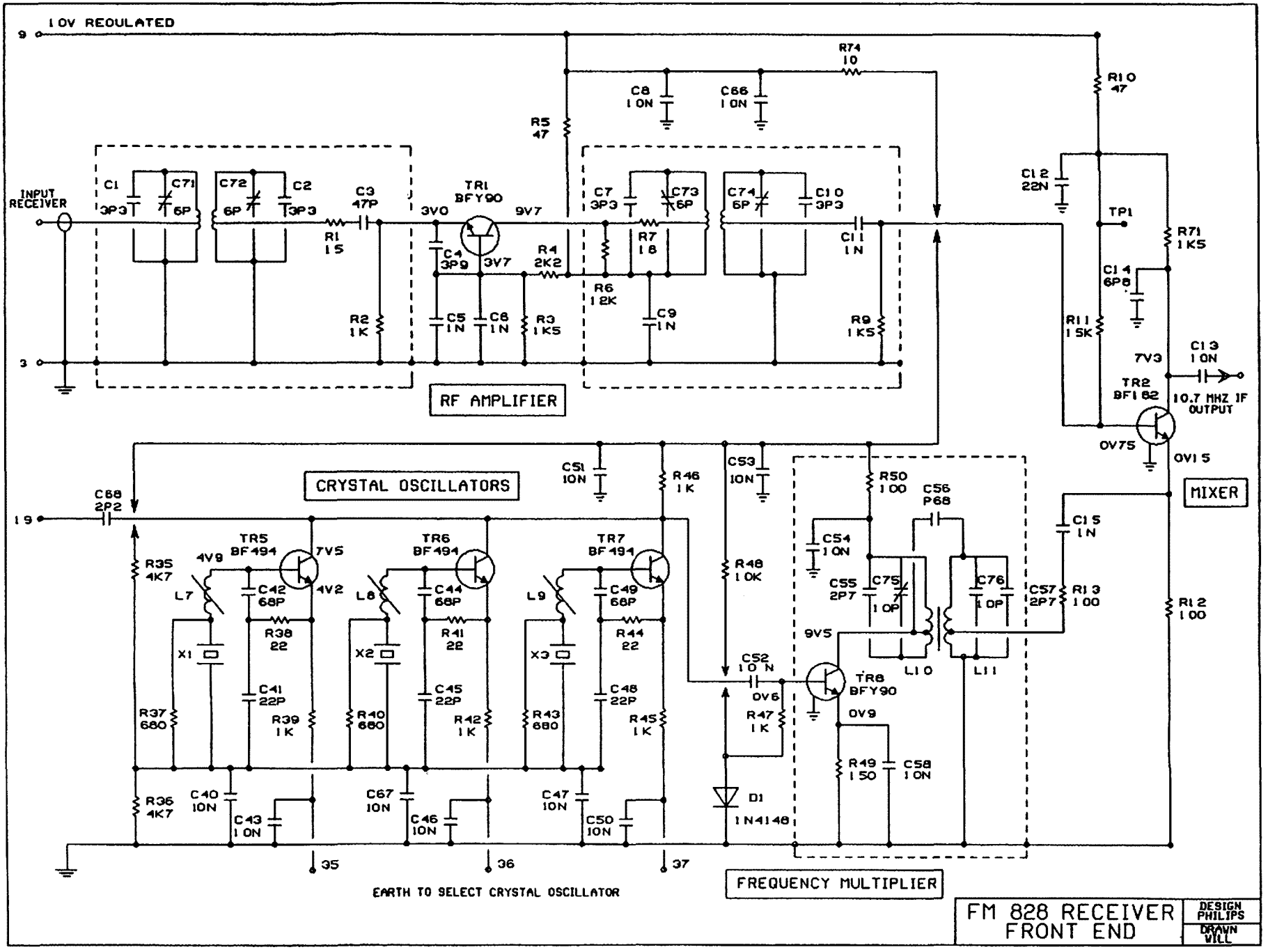
For those of you who only have a poor photo copy of the original circuit this may be useful. It will take a while to present all the circuits, some six in total including the transmitter, but the increased size and module approach will fit an A4 folder or booklet.

All these circuits were produced on computer using the CAD program Draft Choice. If you would like a copy of this CAD program and the FM 828 computer circuits let me know. Not all the FM 828 circuits are completed yet, as they take considerable time to draw onto computer. These circuits can also be made available via packet in 7 Plus format.

The CAD program Draft Choice is an excellent circuit drawing program and being shareware is easy and cheap to obtain. If ever amateurs were to agree on a CAD program for circuit exchange, this would be my recommendation.

**21 Waterloo Cr Lasmurdie 6076 or VK6UU @VK6BBS*

ar


10V REGULATED
9
3
INPUT RECEIVER
C1 3P3
C71 6P
C72 6P
C2 3P3
C3 47P
R1 15
R2 1K
TR1 BFY90
3V0
9V7
C4 3P9
3V7
R4 2K2
C5 1N
C6 1N
R3 1K5
C7 3P3
C73 6P
C74 6P
C10 3P3
R6 12K
R7 18
C9 1N
C11 1N
R9 1K5
R5 47
R74 10
C8 10N
C66 10N
R10 47
C12 22N
TP1
R71 1K5
C14 6P8
R11 15K
7V3
C13 10N
TR2 BF182
10.7 MHZ IF OUTPUT
0V75
0V15
RF AMPLIFIER
CRYSTAL OSCILLATORS
MIXER
C68 2P2
19
C51 10N
R46 1K
C53 10N
R50 100
C56 P68
C54 10N
C55 2P7
C75 10P
C76 10P
C57 2P7
R13 100
C15 1N
R12 100
R48 10K
TR5 BF494
TR6 BF494
TR7 BF494
4V9
7V5
4V2
R35 4K7
L7
L8
L9
C42 68P
C44 68P
C49 68P
R38 22
R41 22
R44 22
X1
X2
X3
C41 22P
C45 22P
C48 22P
R37 680
R39 1K
R40 680
R42 1K
R43 680
R45 1K
R36 4K7
C40 10N
C43 10N
C67 10N
C46 10N
C47 10N
C50 10N
C52 10N
0V6
R47 1K
D1
1N4148
9V5
TR8 BFY90
0V9
R49 150
C58 10N
L10
L11
35
36
37
EARTH TO SELECT CRYSTAL OSCILLATOR
FREQUENCY MULTIPLIER
FM 828 RECEIVER FRONT END
DESIGN PHILIPS
DRAWN WILL

How's DX

*Stephen Pall VK2PS**

December, the last month of the year, reminds us not only of the approaching Christmas season but also of the end of our calendar year. Like Janus, the Roman god of "endings and beginnings", we look back on the past 12 months and take count of the important DX events which took place during this time.

But before we do that, we have to remind ourselves and acknowledge that many of the new countries which are now considered as a separate DXCC country were born out of civil war, death, destruction, hunger, suffering and human misery. Many of these horrible events are still continuing to-day as you read these lines. When taking part in the Christmas festivities, let's think of the sufferings in Somalia (T5) — Cambodia (XU) — Ethiopia (ET3) — Ghana (9G1) — Uganda (5X) — Eritrea (E3) — Croatia (9A) — Slovenia (S5) — Bosnia-Herzegovina (T9) — Macedonia (Z3) — Serbia (YU) — Georgia (UF) and Azerbaijan (UD6), just to name a few.

On the peaceful side of DXing we saw activities from the Czech Republic (OK) — Slovakia (OM) — Howland Island (AH1) — Chatham Islands (ZL7) — Desecheo (KP5) — Kingman Reef (KH5K) — Palmyra (KH5) — Spratly Islands (9M0) — Libya (5A) — Mellish Reef (VK9M) — Tunisia (3V) — Tristan da Cunha (ZD9) and Christmas Island (VK9X).

The above list contains only the most important events which took place during the past 12 months. What about the future? Despite gradually deteriorating propagation conditions and the reduction in sunspot activity, DXing is alive and well. More and more contacts will be made on the lower bands, 30, 40 and 80 metres. The 20 metre band will still be useable but with a less predictable certainty.

I wish all my readers a joyous Christmas and a peaceful, happy and healthy New Year!

Christmas Island — VK9

Christmas Island is an Australian Territory in the Indian Ocean, lying in latitude 10° 30' S and longitude 105°40' E, about 355 km south of Java and 2625 km north-west from Fremantle in Western Australia. The greatest length of the island is about 20 km, the greatest width is about 15 km and the narrowest is about 6 km.

The island was discovered in February 1615 by Richard Rowe, master of the "Thomas", and he gave an account of it in a letter to the East India Company. The island appears on a Dutch chart of 1618 as Moni. Later charts give the name of Christmas Island. HMS "Flying Fish" surveyed the island in 1886 and it was found to be unusually rich in vegetation and bird life. Christmas Island was formally annexed to Great Britain by HMS "Imperieusse" in 1888. Subsequently it was placed under the Straits Settlement Government. The island was not inhabited at the time of annexation and the first settlement was established at Flying Fish Cove in November 1888 by George Clunies Ross. Soon after this rich phosphate deposits were discovered and the resulting mining affected very much the animal and plant life.

Under the Christmas Island Act 1958-9 the administration of the Island was transferred to Australia by the United Kingdom on 1st of October 1958. The present population of the Island is well over 3000. Progress has caught up with the island. There is now a scheduled air service twice a week as against the former charter service by the government.

In the August issue of *Amateur Radio* under "Future DX activity" I hinted that a well known DXer might operate from there with a special call.

Bob Winn W5KNE, Editor of the DX Bulletin "QRZ DX", advised me that his proposed activity in August has been delayed until late in November due to transport difficulties. He will be active from Christmas Island from 27 November to 15 December on most HF bands, CW and SSB. At this stage it looks like he will be the only operator.

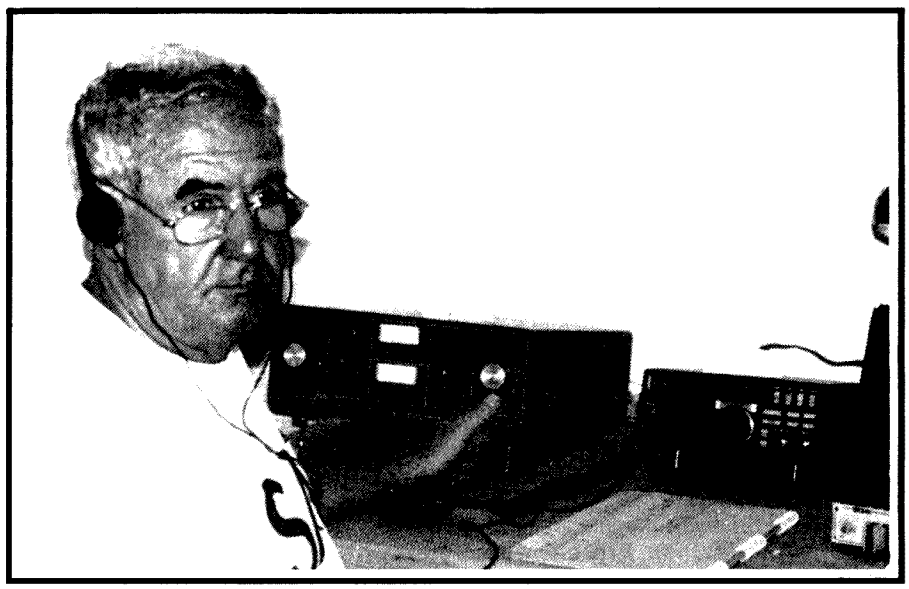
Bob will be signing VI9XN, a special call celebrating the 350th anniversary of the naming of the island. QSL to Bob Winn W5KNE, 635 Williams Way, Richardson, TX 75080, USA.

Nepal — 9N1

Baldur DJ6SI is one of the few DXers who keeps his plans to himself and never announces in advance the country from where he will be operating next. It was on the 25th of August when Baldur and his friends appeared on the bands for a 12 day activity from Nepal. I received his QSL card within 4 weeks of the operation, being mindful that he keeps the logs open only for 6 months after the event. With the card he sent me some information about the radio amateur scene in Nepal. Here are some snippets from his letter:-

Nepal licensed three local amateurs in July 1993. Satisa is 9N1AA, a lawyer in Kathmandu who is interested in RTTY; 9N1HA is Surish, employed by the Nepalese Ministry of Communications and his interest is SSB; and Ram 9N1RB is connected with electronics and is a CW enthusiast.

Unfortunately, due to the harsh economic climate, none of these gentlemen is on the air because of the 300% import duty on radio amateur equipment. Baldur took some transceivers with him with the intention of leaving them behind. He did not succeed. He had to take the FT747, the TS50, the FT757 and other ancillary equipment out of the country again. Baldur and his friends had to pay US $250 per head as a licence and equipment usage fee and waited for four days for documentation. Their licences were the first given in writing (on rice paper) by the Nepalese Government.



Baldur DJ6SI operating as 9N1BD.

Even Father Moran, the late 9N1MM, (according to Baldur) only had verbal permission from the Nepalese King himself to operate. The equipment and the operational area of the group were inspected by a special commission prior to starting the activity. The original logs had to be left behind. However, Baldur was allowed to take copies of the logs with him.

Baldur DJ6SI operated in the SSB and CW mode as 9N1BD, his friend Henry DJ6JC operated RTTY as 9N1HL and Claus, ex 9G1AP, had the callsign 9N1AR Conditions were not the best during the short stay. Kathmandu lies in a deep valley and the towering Himalayas did not assist much in the propagation towards the north.

Antennas used were a G5RV, dipoles for 20 and 15 metres and a Fritzel FD4. They made 7000 QSOs despite the fact that each night between the local hours of 7 pm and midnight there was a two hour blackout — no electricity! Opportunity presented itself to give some training to the three local amateurs. According to Baldur, Satisa, Surish and Ram will be on air only if some outside amateur group is willing to donate the equipment and also to undertake to pay the 300% import duty.

The QSL details for the group are 9N1HL to DJ6JC Henry Lumpe, Zur Beerbeeke 10, 30890 Barsinghausen, Germany; and 9N1AP and 9N1BD to DJ6SI Baldur Drobnica, Zedernweg 6, 50127 Bergheim, Germany. In both cases note the new German postcode numbers.

There is quite a controversy about the QSL practices of Baldur. He publicly declared previously that he keeps the logs open only for six months after the event and that he requires either two "green stamps" or two IRCs for a QSL reply. In a handwritten note to me he says "In Germany the post office pays for one new or old IRC only 2 DM, but the airmail overseas cost 3 DM. A sea mail letter cost only 2 DM". According to some news circulating on North American packet clusters (18th October 1993) Baldur now asks for three "green stamps" or three IRCs for each 9U5DX QSL card. The exchange rate between the American and German currency on the 19th of October was US$1.00 = 1.645 DM. I sent him two "green stamps" and received three 9N2 cards, one for myself and the others for a VK4 and a VK7 amateur which I forwarded to the respective addresses.

Eritrea — E3

I mentioned briefly in the last issue of *Amateur Radio* "that Eritrea was reinstated by the ARRL Awards committee as a DXCC country". The decision was made on the 29th of September and the effective date of reinstatement is the 24th of May 1991. Eritrea was deleted from the DXCC countries list on the 14th of November 1962 when it was annexed by Ethiopia. The Eritrean Peoples Liberation front took effective control of the country in 1991. However, formal declaration of independence came in 1993 following a national referendum on the issue. The ARRL Awards committee felt that there was sufficient evidence of sovereignty to justify the 1991 reinstatement date. The decision means that, in practice, all recent operation will count for DXCC credit. Cards will be accepted by the ARRL DXCC Desk as from the 1st January 1994.

Peter I Island — 3YI

Despite the sudden illness and subsequent surgical operation on Jerry Branson AA6BB, who is the financial organiser of the expedition (NB Jerry is out of danger and improving day by day at home), the expedition is on track to commence operation on the 1st of February 1994.

On the European side, ON6TT has assembled about two tons of equipment and camping gear, additional generators, stakes, chairs, tables, sledge hammers, 300 kg of propane gas, large pots to melt snow, tarps, ladders, snow shovels, 4 km of radial wire and 200 m of chicken wire for the ground system, canned fruit, etc. The list is endless. Each individual operator has to supply his own polar outfit with a cost of well in excess of $1000, plus his own substantial financial contribution to the expedition.

A further $18,000 worth of polar tents, special dried food rations and tested radio and antenna equipment is now being prepared for shipment in the US. What is needed now is money. If you need Peter I Island as a DX country now is the time to test your own generosity. Now is the time to send money to the expedition, not later with the QSL cards. Send your donation to AA6BB, Jerry Branson, 93787 Dorsey Lane, Junction City, OR 97448, USA.

Slims, Pirates and Others

Psychoanalysts say that one has to have an immense inferiority complex combined with a good dose of jealousy to cause you to become a radio amateur pirate. We do hear from time to time of such activity, usually a few days before a rare DX event.

Things got so bad in San Marino that the Amateur Radio Society of that republic (ARRSM) has issued a list of the following pirate calls for which QSL cards sent to their Bureau will not be answered: T7CV — T7KA — T7QU — T7ST — T7ZQ — T7ZT — T72AC — T73A — T76P — T77AL — T77AW — T77GN — T77HM — T77L — T77KA — T77KU — T77Q — T77QN — T77P — T77PK — T77PT — T77Z — T77ZA. Further pirates, as published in various DX outlets, are C31NP — 5Z4DX? — SY/DK7PE — TT8A — 9D2CW? — C31/OZ3JK/m and had no proper authority to operate. Closer to our shores one has to mention "Yvonne" who operates CW only allegedly from "Ducie" island and who appears regularly around 7005 kHz as VR8B working the Japanese around 1200 UTC and sending them many" 88". "She" can be heard with signal strength 9+ in Sydney so the pirate is not very far away, but where??

Future DX Activity

- It was reported that FH/F5NCU will be active from Mayotte Island in the Indian Ocean as from the 10th of October until August next year. QSL to F5NZD.
- Look out for JG2XYV who is operating from the Maldives as 8Q7AA. He will be there until June 1994. QSL to Box 2007, Mali, Maldive, Indian Ocean. Hopefully the mail gets to him.
- At the end of October there was still no activity reported from Pratas Islands (BV0ARL/BV9). It is rumoured the DX group is waiting on the cooperation of the authorities who will arrange transport. Likely start will be the end of November.
- KH4/N7TNL will be active from Midway Island until the 6th of January, primarily CW, 10 to 160 metres including WARC bands. QSL to W1OO.
- Paulo Mauro IV3UHL will be touring the Pacific from 15th November till April 1994 with the following stopovers: 15 Nov — 1 Dec, 3D2 Fiji; 1 Dec — 31 January, A35 Tonga; 31 Jan — 16 February, 3D2 Fiji; 16 February — 8 March, ZK1 South Cook; 8 March — 1 April, F08 French Polynesia. Intended frequencies to be used are CW:- 3505, 7005, 14005, 21005 and the WARC bands; SSB:- 7095, 14260, 21260, and the WARC bands.
- Robert 3B9FR is active again on Rodriguez Island after being absent for almost two years. His address is Robert Gerard Felicite, PO Box 31, Rodriguez Island, Indian Ocean, via the Republic of Mauritius.
- Al ST2/G40JW was worked on the 17th of October by VK5WO. Al is situated in the Sudan and it is assumed he will be there for a few months. He operates on 14062 kHz using only 15 watts to a dipole. He is operating around 1700 UTC which is his local evening time but very early morning in eastern Australia. He is very keen to work VK

because he was brought up in Adelaide. His QSL address was given on the DX cluster as A Szondy, Box 4010, Khartoum, Sudan, Africa.

- C91S in Mozambique will be active again in the near future. QSL to W8GIO.
- Dr Armstrong 9M6BZ was reported planning a new Spratly expedition in the same group, but on a different island.

Interesting QSOs and QSL Managers

- YI0BIF — 14251 — SSB — 0622 — Oct. QSL to the Manager, Box 55072, Baghdad — 12001 — Iraq.
- VP2VE — Lee — 14226 — SSB — 1143 — Oct. QSL to WA2NHA, Howard Messing, 90 Nellis Drive, Wayne, New Jersey, 07470, USA.
- ZC4ML — Mark — 14220 — SSB — 0630 — Oct. QSL to G4LSL, B R Lawrence, Tranby Meanee Rd, Scotton, Catterick Harrison, N Yorks DL9 3NB England or via the ZC4 QSL bureau.
- 9H3SB — Holger — 14245 — SSB — 0621 — Oct. QSL to DL9XAT Ralf Waitschies, Eichenallee 13, D-2057, Reinbek 5 Germany.
- OD5QS — Ola (YL) — 14243 — SSB — 0714 — Oct. QSL to the Manager, PO Box 121, Tripoli, Lebanon or via the Bureau.
- ZL5PX — Geoff — 14213 — SSB — 0708 — Oct. QSL to ZL3PX, G A Chapman, 8 Boys Place, Christchurch, 8001 NZ.
- PJ7/K1VSJ — Howie — 14226 — SSB — 1242 — Oct. QSL to K1VSJ Howard M Bromberg, 21 Wingate Rd, Providence — RI 02906, USA.
- VK9LO — 14027 — CW — 1247 — Oct. QSL to K6VNX Arien T Turiff, 8819 E, Calitta St, San Gabriel, CA 91775 USA.
- EL2PP — Monica — 14222 — SSB — 0611 — Oct. QSL to N2CYL Toni A Bull, 726 Linden Ave, Pleasantville, N J 08232, USA.
- Z32ZM — Mome — 14222 — SSB — 0551 — Oct. QSL to YU5CXY Radio Club Nicola Tesla, Box 179, 91300, Kumanovo, Macedonia.

From Here There and Everywhere

- Not only Sydney and Wales celebrated the 75th anniversary of the first direct wireless message between the two countries (See AR Nov 93 issue). The small village of Follina, in the Province of Treviso, near Venice in Northern Italy had a special event station operating on the 24th of October with the callsign IY3GM, the commemorative Marconi station celebrating the event in which Marconi himself played an important part.
- The Spratly Island cards — 9M0S — are ready and you could have had your cards by now. It is interesting to note that from the 17506 CW contacts only 147 QSOs, and from the 17647 SSB contacts only 342 QSOs, were made with the Oceania region, which contains 48 DXCC countries.
- Nigeria celebrated 33 years of independence. Some amateurs used the prefix 5N33 to celebrate the event.
- Randy 9G1XA closed operations in Ghana on the 26th of September with a total of 18000 QSOs completed, mostly CW on the WARC bands. QSL to K0EU.
- Cyril G2HDR quotes an article in the "Family Tree Magazine" that the Canadian post office is very zealous about the correct use of postcodes. Mail which carries an incorrect code, or only a PO Box number without the name of the boxholder, will not be delivered.
- Due to propagation path changes the ANZA net (21205 kHz, control VK4CPA) will start the check-ins from 0500 UTC.
- It was reported that Marcel ON4QM could be active in the future as S92QM.
- 7X2LS — Sadek — changed his direct QSLing address to S Laskri, 47 Rue Voltaire, Leval Louis Perret, 92300, France.
- HZ1AB — Ed — is putting in a very strong signal exceeding S9 from Saudi Arabia on the various nets. He has a 900 foot rhombic at 80 feet, a 160 m Delta loop with the apex at 120 feet, and 1200 feet of two wire Beverage antenna.
- 5X1B has given a new postal address as Jim Brandenburg, American Embassy, PO Box 7007, Kampala, Uganda, Africa. This differs from the address given in May.
- 5R8DS was active in October on the 10 MHz band, CW. QSL to Ben, Box 404, Tana, Madagascar.
- Radio Club FK8KAB/portable was active on 15 and 16 October from Teoudie Beach celebrating the 100 years anniversary of the opening of the submarine cable and the first telegraphic message from "Mon Repos" beach near Bundaberg to Teoudie Beach New Caledonia.
- Paul 3B8AD has reported that the activity of FR5ZQ/J from Juan De Nova ceased on 7 October. It is now only a weather station and future activity from that Island is most unlikely.
- Heard Spiro — ZA1N — giving his QSL address as Radio Club of Tirana Box 66, Tirana, Albania.
- HS0ZAL Linda and HS0ZAK John are very active. Both are associated with a hospital in Chachoengsao. QSL to N4TMW.
- ET3BH is active on 21027, 18136, 18142, and 24960 kHz. QSL via SM3HLL.
- Contrary to previous news about Monk Apollo's SV2ASP/A activity from Mt Athos, the reality is "negative". Apollo is still in silent protest and is not talking to the world except exchanging greetings in Greek with Selim OE6EEG. When JA3MNP and SV2WT were visiting Mt Athos they were allowed to make only 10 RTTY contacts because of the protest by Monk Apollo.
- Roger G3SXW left London on the 19th of September for Tristan da Cunha and started up as ZD9SXW on 30 September. He was active on all the 9 bands. He is an excellent CW operator and it was a joy listening to his contacts. He was quite a good copy in Eastern Australia early in the mornings on 21 MHz. I did not manage to break the "wall to wall" activity of the Ws and JAs when working on the long path in the direction of the North Pole. As at 18 October Roger had made 21000 QSOs and closed operations on 22 October. QSL to his home call, Roger Western, 7 Field Close, Chessington, Surrey, KT9 2QD, England.
- The CQ WW SSB Contest (Oct 30-31) and the CQ WW CW Contest saw at least 70 very exotic DX callsigns activated. As it is very difficult in a contest situation to obtain proper QSL routes, I am prepared to assist you. Please send all your QSO details (date, mode, band, time, callsign) with a self-addressed, stamped envelope to me and I will give you the QSL route if I have it.

QSLs Received

9N1BD (1M MGR DJ6SI) — ET3DX (6W MGR JH1AJT) — W51JU/KP1 (6M OP) NF6S/KP1 (6M MGR W51JU).

Thankyou

Thanks to all of you who kept me informed and who assisted me in compiling these notes, especially to VK2AML, VK2KCP, VK2KFU, VK4CY, VK40H, VK5QW, VK5WO and DJ6SI, and publications QRZ DX, The DX Bulletin, and the DX News Sheet.

Good DX and 73

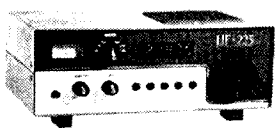
PO Box 93 Dural NSW 2158

ar

SHORTWAVE RADIO

At Emtronics you can source the largest range of Shortwave Radios for professional, amateur and SWL. Brands such as JRC, AOR, LOWE, KENWOOD, & ICOM, do not need any introduction. We also supply SW receiving antennas & accessories!

LOWE:HF-225 & HF-150



HF-225 only **$1450**

LOWE ELECTRONICS presents "The Best of BRITISH" two brilliant new receivers. As a logical alternative to the Japanese "PUSH BUTTON PORTABLES" the HF-150 & HF-225 receivers are "REAL RADIOS" within your price reach. With a built-in ECSS, memories and filters, these radios are unique, user-friendly, and top performers!

HF-150 only **$995**

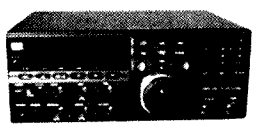
AOR: AR-3000A

The "TOP" of all communication receivers-scanners is certainly the by now famous AR-30000A. The multi mode radio is used by more agencies, departments, and SWL than any other receiver. It covers a freq range from 100KHz to 2036MHz.

$ CALL

JRC: NRD-535G

Worlds best short wave receiver. Superb features include double front-end tuned circuit, optional ECSS, band pass tuning, all mode reception, memories search, scan & sweep and modular construction.



$ CALL

KENWWOOD & ICOM
COMMUNICATIONS RECEIVERS
AT BEST PRICES AT **EMTRONICS**

NEW NEW NEW

POWER SUPPLY

MODEL

K205

This unique new regulated power supply will run all your HF/VHF/UHF transceivers and can be used for other applications as well.

Specifications:

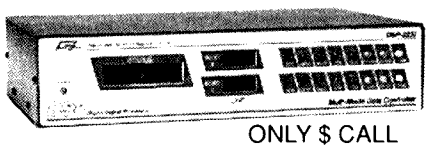
Input voltage.....240V, Out voltage 13.8V
Out current .....20A, Peak out. current 22A

ONLY
$395

DIGITAL COMMUNICATION

AEA **DATA CONTROLLERS** represent the most exciting value in amateur radio today.

DSP-1232 & DSP-2232:



ONLY $ CALL

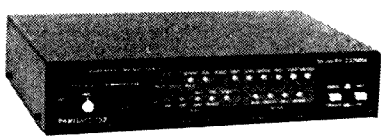
Take a fast trip to the future, with these digital sgnal processing) DSP/MULTI MODE DATA CONTROLLERS. Internal software provides all popular digital amateur dta modes. Unique LCD read-out on the DSP-2232 displays the mode and diagnostics for both channels.

PK-900: THE STEPPING STONE BETWEEN '223MBX & DSP-2232.

ONLY $1425

With features borrowed from the '2232, plus a few features that are unique: Dual simultaneous ports, software selectable modems, 9600 baud modem & PACTOR, and many other features.

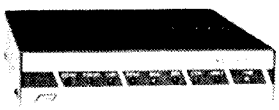
PK-232MBX: MULTI-MODE DATA CONTROLLER



ONLY $750

With over 70000 units sold worldwide the PK232MBX is the worlds leading multi-mode controller. Combining all amateur data communication modes in one comprehensive unit.

PK-88 HF/VHF PACKET TNC BEST VALUE IN PACKET RADIO!



ONLY $330

The PK-88 is loaded with unique features and backed with proven hardware and software design.

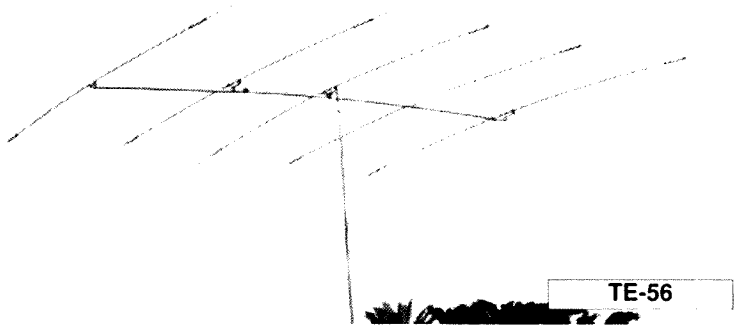
Get the exclusive analog FAX RECEPTION WITH the new AEA-FAX package

ATV Master for SSTV&FAX The Perfect Accessory for Amiga PC & SW Receiver!

BEAT THE SUN SPOTS

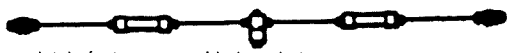
For the next few years, you can amost forget DX-ing on 10 & 15 metre bands. Tremendous deterioration of DX-ing will also occur on 20 metre band. So what is the answer? There is only one and only one answer! THE NEW FOUR BAND (7-14-21-28 MHz) BEAM ANTENNAS from TET-EMTRON the INNOVATORS in HF antenna systems, TET-EMTRON IS AN AUSTRALIAN PRODUCT!

TET-Emtron ANTENNA SYSTEMS



DESIGNED AND MADE IN
AUSTRALIA

ED-52C ALL BAND WIRE TRAP ANTENNA



- Completely factory assembled ready to use
- Heavy 14 (7/22) gauge standard copper antenna wire to survive those severe storms
- Centre fed tuned feedline supplied.
- Only two traps
- Includes centre insulator with an eye hook for centre support
- Includes custom in sulators molded of top quality material with high dielectric qualities and excellent weatherability
- Overall length 33 mtrs less when erected as an inverted vee or sloper
- Handles 2 kw PEP & covers 80 through 10 metres **$179**

TET-EMTRON VERTICAL ANTENNAS

EV-3, 14-21-28 MHz, $149
EV-3W, ALL WARC BANDS, $189
NEW EV-5, 3.5-7-14-21-28 MHz
UNIQUE NEW ANTENNA - $299

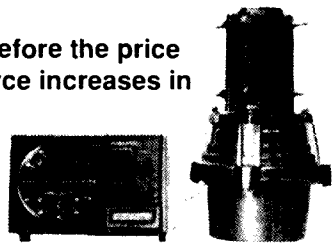
WORLD'S LARGEST SELECTION OF HF-BEAM ANTENNAS

TE-3 BAND SERIES		**TE-4 BAND SERIES**	
TE-23 2 element 3 band 14/21/28	$414.00	TE-34 3element 14/21/28 1 element ZMhz	$695.00
TE-23M 2 element 3 band mini 14/21/28	$440.00	TE-44 4 ELEMENT 14/21/28 1 ELEMENT ZMHZ	$870.00
TE-33 3 element 3 band 14/2/28	$575.00	TE-433HB 3 element 14/21/28 2 element ZHmz	$850.00
TE-43 4 element 3 band 14/21/28	$750.00	TE-443HB 4 element 14/21/28 3 element ZMhz	$1100.00
HB-35C 5 element trapless 14/21/28	$990.00	**TE-6 BAND SERIES**	
TE-7 BAND SERIES		TE-26 1 elem 14/21/28 1 elem 10/18/25	$380.00
TE-47 3 elem 14/2/28 1 elem 10/18/25 1 elem 7MHz	$995.00	TE-46 3 elem 14/21/28 1 elem 10/18/25	$750.00
TE-57 3 elem 14/21/28 2 elem 10/18/25 1 elen 7MHz	$1200.00	TE-56 3 elem 14/21/28 2 elem 10/18/25	$1075.00

ROTATORS GALORE

Grab your Kenpro Rotator before the price hike! Unstable Dollar will force increases in the near future!

KR 400
KR 400RC
KR 1000
KR 5400B
Dual Azmith/Elevation
STay Bearings & Rotator Cable in stock



ANTENNA ROTATOR PACKAGES - ONLY UNTIL 31/11/93

	RRP	SPECIAL
KR-400 + TE-33	$1,175.00	$1,100.00
KR-400RC + TE-33	$1,250.00	$1,175.00
KR400 + TE-23M	$1,100.00	$1,025.00
KR1000 + TE-HB-35C	$2,135.00	$1,950.00

EMTRON'S PRECISION CROSS NEEDLE RF EP2000 SWR METER

$149

Yes the new from EMTRON - highly accurate CROSS-NEEDLE SWR & POWER metre, model EP-200 with a freq range from 1.8 MHz to 60 MHz and power rangers 20 200 watts, gives instantaneous readings of forward/reverse power and SWR plus 2 KW.

EMTRON BALLUNS WITH BUILT IN LIGHTING ARRESTOR

- *For dipoles yagis inverted vees and doublers
- *Replaces centre insulator
- *Puts power in antenna
- *Broadbanded 3 40MHz
- *Small lightweight &weatherproof
- *1:1 impedance ratio or 4:1
- *For legal power and more
- *Helps eliminate TV
- *With SO 239 connector
- *Built in DC ground helpsprotect against lightning

Only $59

ANTENNA CENTRE INSULATOR

- *Small,rugged,lightweight,weatherproof
- *Replaces centre insulator
- *Handles full legal power and more
- *With SO 239 connector

$20

COAXIAL SWITCHES	DATONG:	EMTRON:
CX201 - $45	D70 Morse Tutor	ETP-1 RX ATU-PREAMP
CX201N - $69	RFA Broad Bond Rx preamp	EAT-1000 ANT. TUNER
CD401 - $99	ANF Auto Notch R x Filter	COLLINS 1:1 LIL BALUN
CX401N - $120	VLF Converter	

BANKCARD MASTERCARD & VISA

SYDNEY STORE & HEAD OFFICE
94 Wentworth Ave. SYDNEY
PO Box K21 HAYMARKET, 2000
Ph: (02) 211 0988 - 3 lines
Fax: (02) 281 1508

EMTRONICS

VICTORIA
Ph:(03) 700 5428

QUEENSLAND
633 Logan Rd, GREENSLOPES 4120
PH:(07) 394 2555
Fax: (07) 394 4316

WEST AUSTRALIA
Shop 3, 443 Albany Hwy
VICTORIA PARK 6100
Ph: (09) 470 1118
Fax: (09) 472 3795

MAIL ORDERS WELCOME

NZ AGENT
Pottinger Business Services
Ph:4-567 1842
Fax:4-567 1842 (request)

VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC

Six metres

Generally the band has been quiet. On 26/10 Gary **VK4AR** reported working some VK3s via Es. His previous DX contacts had been in July when VK3s and T30JH were worked. Adam **VK3ALM** (ex VK3YWV) reports that 23/10 was the first Es this summer season, with DDQ-0 weak, followed by the VK4RGG beacon at 1000 with signals 579. Next heard was Ron VK4BRG at 1010, and at 1026 Gary worked Trevor VK4AFL with signals to S9+. His previous DX contacts had been JA8CAR on 25/3 and T30JH on 10/4.

Europe

There is a mixture of information from Geoff GJ4ICD and Ted G4UPS but although there has been a general reduction in Es activity, it appears there are so many operating 50 MHz that any form of Es improvement will result in contacts. I note that the distance from London to Madrid in Spain is about 1250 km (similar to Sydney from Adelaide) which is a good Es distance, hence their regular working to Spain. So there would be quite a number of countries around 1600 km, the prime distance for single hop Es. London to Paris at 350 km would need to be short skip.

KD4MAE will operate from Saudi Arabia for two years with the probable call-sign of 7Z1AB. Geoff GJ4ICD has sent a beacon to Eastern Malaysia to operate on 50.014 MHz with the call-sign 9M6SMC, this could be a useful beacon for us to monitor.

One not so useful is Eric F5JKK (ex-TL8MB) operating with the prefix 5T5 from Mauritania (IL30AM) which takes in a large slice of the Sahara Desert. He has worked G land via double hop Es. On 11/10 he had a TEP opening to PY5, ZP and LU at 1630, followed at 1700 by a path into SV9 and 5B4. Incredible!

As time goes by I am sure we are going to hear more of these TEP paths simply because there are so many countries now operating 50 MHz. It is quite apparent that TEP paths are not confined to north-south directions, they can be at oblique angles to the equator. As we slide deeper into the low part of Cycle 22, I also believe there will an upsurge in double-hop Es providing signals to the northern part of Australia from Asia and the Pacific regions. Don't put away your six metre gear too soon!

The 50 MHz DX Bulletin reports a message from 9H5EE stating that Edmond ON1LGS (ex-3X1SG), will visit Vietnam for 15 days in December 1993 and then for six months during 1994 and is likely to operate on six metres.

Ted Collins **G4UPS** sends a list of 143 call-signs licensed to operate from Greece. September activity included the following call-signs: 4N1SIX, 9H1, CN8, CT0WW, EH, EH9, OZ6, S55ZRS, SV1, SV9, SM7, SP4, YT1. This is a much reduced list compared with July and August. However, it is interesting to note that Ted had almost daily contacts with SM7AED at a distance of around 2000 km over a mostly water path.

First Worked on Six Metres

This list continues to be of interest and I have received several letters since the last list was published in September, so there will be some more alterations. My greatest regret is that there must be many operators in VK who have no access to this list, due to not receiving *Amateur Radio* magazine, some of whom may well have worked countries earlier than those listed.

However, I can only do my best and I appreciate those people who take time to write with up-dates or additions. I am not rushing to publish the final list as, when time permits, I do some sleuthing of my own where queries have been raised and I do have the advantage of knowing the times of contacts. More later.

With the passing of some of our oldest amateurs, I suppose it is now too late, but wouldn't it be nice to know the first two Australian amateurs to work one another on 56 MHz or five metres as it was known. Such a contact was probably made prior to World War II. Perhaps our remaining senior members or their descendants could contact me if they are able to provide any definite information. Also, I wonder who made the first five metre contact to a station outside Australia? Outside Australia would commence with New Guinea, New Zealand etc.

Lance **VK4ZAZ** has raised the issue of the non-inclusion of KA call-signs. KA was a special prefix used by the US occupation forces in Japan to 14 May 1972 after which they reverted to JA. For starters, Lance suggests KA7AX worked on 22 June 1960. Who else?

Ross Hull Memorial VHF-UHF Contest

John Martin **VK3ZJC/VK3KWA** has forwarded advance information regarding the above contest and I draw your attention to the 1993-94 rules which are published in *Amateur Radio* this month, the contest running from 1800 Saturday 25/12/93 to 1800 Sunday 16/01/94. In Eastern Summer Time that means you start at 5 am on Sunday 26/12.

John asks that you should not operate on the DX calling frequencies of 50.110 and 144.100, and he prefers that you use 50.125 as the lower limit for contest activity, in fact, he states that he will disqualify anyone who consistently carries on any contest activity on 50.110. You might be forgiven for thinking "At this part of Cycle 22 what DX is likely to be on 50.110?" That's true, but then you never know all the capabilities of six metres, so leave it free, just in case — after all, it is actually an international calling frequency.

For local contacts (which includes Es contacts), he says that it would be better to help populate the 52-54 MHz segment of the band. For those who remember earlier days, we used 52.050 as a calling frequency and there is plenty of room in the first 200 kHz to fit in all stations likely to be operating at any one time. If we did that it would bring back memories of the crystal-locked AM days when we heavily populated the first 500 kHz!

The 1994 **VHF-UHF** Field Day Contest will be held over the last weekend of the Ross Hull Contest, with the rules similar to last year, and I urge you to join in both contests and to send in your logs. I regret my physical impairment no longer allows me to go into the field, but for many years I made an annual pilgrimage to some favourite hill-top, and in most cases, enjoyed every moment of it.

On the subject of the Field Day Contest, **Doug Friend VK4OE**, has advised that he will be operating portable from a selected spot near Dorrigo in northern NSW, locator QF59GW, with a good take-off in all directions except, broadly speaking, west where there is some higher ground, but at a distance not likely to provide too many problems.

Doug will operate on all bands from 50 MHz to 2.45 GHz with the prime purpose of working DX but also to participate in the contests. From a similar but slightly inferior position last March, in the John Moyle Field Day he had some contacts to Brisbane on 1296 MHz. Given reasonable propagation conditions he expects contacts to Sydney and Brisbane on 144 and 432 SSB to be relatively easy and special attention will be given to 1296 MHz.

Operating times will be from 0900 on Saturday evening of 15 January to some time on Sunday 16/1 afternoon (or evening), depending on conditions, using SSB and CW. He will be calling and listening on 144.100, 432.100 and 1296.100 and will shift to 144.115 and 432.115 for

sustained operating. On 50 MHz the frequency will depend on band conditions and there should be no problems with Es contacts. He will be operational between 2.40 and 2.45 GHz for contacts by arrangement! On the subject of arranging contacts, if 144 or 432 cannot be used then Doug could probably be contacted by cellular telephone on 018 191 066.

Equipment used will be: 144: 150 watts to 2 x 10 el DL6WU; 432: 130 watts to 2 x 21 el. DL6WU; 1296: 60 watts plus mast-head amp to 4 x 55 el. loop yagis; 2.4: 4 watts plus mast-head amp to a 45 element loop yagi. He also will appear from time to time on 146.500 and 439 MHz FM. (Sounds like the type of portable station I used to have in my latter years .....5LP).

Doug also mentioned that during January 1993 he operated on 1296 MHz from Siding Spring and contacted VK1s, VK2s and VK4KZR/4 at Mount Mowbullan, north of Toowoomba, the latter setting a new Queensland record for that band. Unfortunately, he forgot to tell me about it!

The microwave bands

A letter from Mark VK5EME indicates things are really "humming" in South Australia in regard to the microwave bands, and thought is being given to the formation of a VK5 UHF/Microwave Group. Microwave kits are being designed with new transverters for 1.2, 2.3 and 3.4 GHz.

Mark is presently in the production of an ATV repeater with an FM output on 2372 MHz and an FM input on 1250 MHz. Secondary receiver VSB frequencies are 426.25, 444.25, 579.25, 1246.25 and 1286.25 MHz. There are plans for similar equipment on 2328 and 10345 MHz FM.

Beacons: Mark says that new beacons for VK5 are on 1296.550 MHz 60 mW output — operational and has already been heard in VK6; 2304.550 MHz 9 mW output — operational. The next project is a beacon for 10368.550 MHz while others are planned for 2304.550 and 3456.550 MHz. All three have been licensed.

Also, a Packet Radio transmitter/receiver is planned for 1296.900 and 2304.900 MHz; voice repeater on 1281.475 transmit and 1293.475 receive.

In his "spare time" Mark is almost operational on 10 GHz after successfully arriving on 2304 MHz. Good home-brewing Mark....5LP.

10 GHz Records

John Martin VK3KWA FTAC Chairman, sends confirmation of the new national 10 GHz record which was set by Roger Bowman VK5NY and Bill Pickering VK5ACY on 22 April 1993 over a distance of 355.4 km. See November *Amateur Radio* for details of this contact. Congratulations.

On 24 April 1993, Steve Hutcheon VK4ZSH and Neville Mills VK4KOP set a new 10 GHz ATV record, working a distance of 144.3 km. Steve was portable in VK2, so this contact also means a new VK2 state record. Well done.

Beacon information

John VK3KWA refers to my comments regarding beacons in October AR, and says that VK7RSB on 50.057 is off air and could be replaced by a new beacon signing VK7RNW. This beacon will also operate on 144.474 and 432.474 and possibly 1296 MHz. VK7RNT is also QRT. The Gold Coast beacon is identified as VK4RGG, located at Nerang and using 50.058 MHz.

Apparently the beacon situation in Victoria is unchanged. The only operational beacons are VK3RAI on 432.450 and VK3RMB on 432.535 (nominal) — it is FSK and its mark and space frequencies fall between 432.536 and 432.537. Unfortunately, VK3RAI precludes some Melbourne operators from hearing VK5VF on its correct frequency of 432.450 MHz.

I am disturbed to learn that FM nets have appeared on 144.400, 144.525 and occasionally 144.475, all in the beacon segment, which is unfortunate as they can splash over on to legitimate beacon frequencies. Just one two metre beacon in Melbourne would be of immense value to operators in other states and maybe assist in clearing the beacon segment of other operators.

It seems strange to me that a large city like Melbourne, sitting at the cross-roads for VHF/UHF operation with contacts possible to VK1, VK2, VK5 and VK7 under reasonable conditions, has the least effective beacon set-up in the nation. I'm sorry Melburnians, but at times like these I cannot help but draw a comparison with Geoff GJ4ICD on tiny Jersey Island, who personally built quite a number of 50 MHz beacons and despatched them, gratis, to out-of-the-way places so that others could know when the band was open to those areas. (Latest information indicates Geoff is still making beacons!) So, I will be very happy to report when a two metre beacon in Melbourne is operating 24 hours a day on 144.430 MHz.

Bob Biinco VK6KRC has written regarding my AR request for an update on beacons. The Perth beacons are located at Bob's QTH of 30 Second Avenue, Cloverdale, for the time being, hopefully to be moved soon! Bob reports all beacons are independently on/off keyed and signing "VK6RPH Perth" followed by approximately 30 seconds of key-down period. Frequencies are 50.066, 144.460 and 432.460 all with a power of ten watts, 1296.460 at three watts, all are horizontally polarised. Thanks.

Ted Collins G4UPS advises new beacons as ES0SIX on 50.037 MHz, ES6SIX 50.011.3, ZS1SIX 50.080 and SV9SIX 50.010. Ted also reports, *On 9 August 1993 the antenna for the JA7ZMA beacon was changed from a 6-ele yagi to stacked horizontally polarised 5/8 wave turnstyles. The old antenna was beamed south so the omni-directional antenna will reduce the signal strength to VK and P29 etc — but the new antenna will give increased signals to all other directions.* JA7ZMA operates on 50.026 from QM07.

Geoff Brown GJ4ICD reports he has dispatched a new beacon for 9M6SMC and also the one for Z21SIX finally arrived. The next beacon to be made will be for 8R1SMC on 50.013. The FY7 beacon is still there on 50.039 FSK. TF3LB has rebuilt the Iceland beacon on 50.057. OD5SIX is also operating.

The 1993 Perseids

The only report I received came from John VK3KWA, who commissioned a new linear amplifier on the night of 11 August. Turning on the transceiver, he noticed a few very healthy pings at 1000 from VK4RBB, the Mount Mowbullan beacon on 144.400. He made several STD calls and in response arose at 1900 but he found conditions hopeless — about a dozen minor pings. He remarked, "We are obviously in the wrong hemisphere."

Emil Pocock W3EP of QST's *The World Above 50 MHz* has given considerable space to reporting the Perseids in his November pages. He said, *The 1993 Perseids meteor shower didn't live up to the expectations of many who predicted a great storm, but it still generated a great deal of activity. Experiences varied depending on location and on-the-air time. There were no tremendous surges, as in 1991 and 1992, yet many visual and radio summaries suggest there were definite peaks, as well as an unusual number of long-lived meteors.*

The following is a resume of Emil's writings: Peter Brown of the International Meteor Organisation said that on the basis of many visual reports from around the world, the period of highest activity appeared to be 12 August between 0030 and 0530, with average zenith hourly rates of 200 or more, with a spike of 500 meteors occurring around 0300 to 0330. This spike fell within the time frame of the great 1991 and 1992 surges, at 2000 on 11/8 to 0500 on 12/8, adjusted for 1993.

Meteor shower contacts are easy to make on 6 metres and virtually no VHFer gives 10 metres a thought. Gary Stone,

N5PHT in Texas, wrote about more than 100 contacts he made on 10 metres during a two-hour period early on the 12th.

The most popular band was two metres, the more active operators made a dozen or more contacts and completed two-thirds of their schedules. Ken KH2F/W3 worked 20 new grids in 15 hours operating from a portable site, all contacts in the 1900 km range. Carl KM1H made about two dozen contacts and noted some very long burns of two minutes or more on 11/8 at 1711 and 1724. Charlie Calhoun W0RRY (EM26) worked Ray N1GDP (FN55) at 2400 km and then made one other 2400-plus km contact to K6AAW (CN80), thus linking both coasts.

In the absence of any news to the contrary, it seems that VK was not well situated or operators were looking at the wrong time. Certainly the US results are very impressive. It seems meteor contacts on 432 MHz are difficult with short duration pings, nevertheless, on 14 July at 1114, (before Perseids), Larry WB5KYK worked NW3C but took 59 minutes to do so, using CW at about 50 wpm and single yagis and less than 200 watts.

EME activity

Doug VK3UM still manages to notch up some good scores from his EME efforts. During a contest on 9 and 10/10 he managed 34 QSOs sandwiched amongst work related call-outs due to thunderstorms. Due to his moon visibility at both ends he has two periods per day in which to work stations. Doug usually operates on 432.018 MHz.

On 9/10 from 0000 to 0050 he worked RA3YCR, SM4IVE and OH2PO. From 1614 to 1806 he worked VE3ONT (very strong signals 58N and 57N), K1FO, K4QIF, N4GJV, N2IQU, W7GBI, K0RZ, WD5AGO, N7ART, K2UYH, N9AB, W7CI, JA9BOH and JA6ZHR.

On 10/10 he commenced at 0027 by working DL9KR 56N during a hail storm, then to 0052 G4RGK, DJ6MB, F5FHI, DF3RU, F5HRY, EA3UM, DF6NA, and from 1652 to 1941 KD4LT, WA3FFC, WA6BJE, K5JL, K1RQG, K6VWM, JA2JRJ, KB8ZW, JA4BLC. The majority of signals were around strength 4 to 5.

Closure

With this issue I commence my 25th year as your scribe for these columns. Little did I believe I would still be here after being "dobbed" for the job by the VK5 Federal Councillor, Geoff Taylor VK5TY, at the 1969 WIA Annual Conference.

Thank you to all who have made contributions during that time and special thanks to the Editor and staff of *Amateur Radio* for their ability to survive my ramblings. Things are easier today with the use of a computer and the forwarding of a monthly floppy disk of news, but it still takes many hours of work to put together these columns.

The summer Es season is upon us and if the same pattern of contacts in our hemisphere follows those of the northern hemisphere, then we should not be short of contacts. Do please keep the international DX calling frequency of 50.110 clear for that rare contact — you can always monitor that frequency by placing the frequency into the memory of your transceiver while you work further up the band.

To all my readers, best wishes for Christmas and may the New Year bring you something special. Remember that the Ross Hull Contest commences early morning on 26 December.

Closing with two thoughts for the month:

1. Christmas is a time when you get homesick — even when you are home! and
2. The height of confidence is standing up in a hammock.

73 from The Voice by the Lake.

**PO Box 169 Meningie SA 5264*

ar

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

VK0 — Who is There?

In the latest issue of the Call Book, 27 VK0 callsigns are listed. If any operator is looking for a contact with VK0, you will NOT find 27 operators down south.

Some problems must exist between the Spectrum Management Agency (SMA) data, licences actually issued and Call Book listings, let alone the fact(?) that there is only one operator down south. Or has been by the time this letter is published.

The list below has been compiled from my incomplete records and tries to show when the listed callsign was issued to the present holder:

VK0AE	1988	VK0CN	1992	VK0LH	1990
VK0AP	1990	VK0DG	1993	VK0NE	1988
VK0AO	1986	VK0DI	1993	VK0TW	1988
VK0AT	1990	VK0DS	1991	VK0DIK	1991
VK0AW	1991	VK0DY	1990	VK0KZA	1990
VK0BH	1991	VK0FY	1988	VK0NUT	1993
VK0CC	1986	VK0GC	1988	VK0SKS/KSK	1992
VK0CE	1986	VK0JR	1991	VK0YIP	1991
VK0CH	1991	VK0KH	1986	VK0ZCM	1992

If any reader can give me more information, I would be very pleased to hear from them.

Neil Penfold **VK6NE**
QSL Manager VK9/VK0
2 Moss Court
Kingsley WA 6026

Old Timers' Recollections

Just thought you would like to know that I'm very happy with the delivery times of *Amateur Radio*. It turns up generally the first week of the month here at Cairns in far north Queensland.

I would like to read more old timers' stuff and stories, such as old time valves, the start of broadcasting, etc.

Can you pay a bloke to go around and personally quiz the old timers? Don't do it now and that information is gone forever. I suggest people like VK3SY (3GL), VK3SW (radar), VK3AJF (PAs, army) and VK3ALG (early days).

Paul Gregory VK4YFF
1/124 Sheridan St
Cairns QLD 4870

(No, we can't pay, Paul, but perhaps someone from Geelong, such as the four you named, might like to volunteer. Any offers? Ed)

Praise for Gold Coast

The FM channels have produced hundreds of nets all around the country.

One, VK4RGC on the Gold Coast, must surely rank as one of the most friendly, efficient and helpful of them all.

Operating on 146.7 MHz it has a tremendous range because it is on a high mountain some distance from the Pacific Ocean.

Each morning at 0800 hours precisely the operator on duty for the morning welcomes those on frequency. The first few minutes provide amateur radio news, particularly Gold Coast Amateur Radio Society activities such as a BBQ for members and visitors. National WIA items also feature. In many ways it is a daily version of the WIA Sunday broadcasts throughout the country.

After about five minutes' news the operator calls in those wishing to "talk" or "listen". All calls are acknowledged, and "talkers" called in.

An amazing variety of information comes from the callers. Their requests regarding holiday travel, entertainment, etc are answered very professionally and politely. Being a thriving holiday centre there are always many itinerant radio amateurs in the Gold Coast area.

I first heard of the net from a VK4 I worked before visiting the area a few

weeks ago. The VK4 suggested I take my handheld. Operating from the eighth floor of a high rise on the ocean edge I apparently put a hefty signal into the repeater. From Byron Bay, well south of the Gold Coast, I also had no trouble triggering this repeater.

For those thinking of retiring to this Shangrila of the South Pacific reports indicated the councils were "amateur-radio-friendly".

For more details on this very functional repeater contact Ken VK4KD, one of the people behind this unique operation.

Roth Jones VK3BG
23 Cherry Tree Grove
Croydon VIC 3136

Morse Again — NZ Survey

In the July 1993 issue of the NZART publication *Break In,* a membership survey on Morse was published. Below is the result of 942 returns from members. While not wishing to start, or prolong the existing "Morse or no Morse" discussions, here are some views from New Zealand.

1. NZART supports the continuation of Morse as an entry test for full amateur privileges — 62%.
2. Competency in Morse code for full privileges — 76%.
3. Other tests should be available to parallel Morse — a mixture of results — essential 8%; desirable 17%; acceptable 14%; perhaps 30%; unacceptable 24%.
4. If the general licence (our AOCP) is to continue to require Morse code proficiency the minimum standard should be — 15 WPM 5%; 12 WPM 57%; 10 WPM 20%; 6 WPM 11%.
5. The NZART should seek abandonment of the CW test — now 12%; when possible 25%; never 54%.
6. Should NZART have an HF no-code licence if this means isolating ourselves from world standards — perhaps 15%; never 64%.
7. Morse is an important mode that should be encouraged, even if this is not needed to obtain a licence — definitely 76%; neutral 17%.

Some minor percentages have been omitted where they do not affect the result.

Neil Penfold **VK6NE**
2 Moss Court
Kingsley **WA** 6026
ar

Pounding Brass

*Stephen P Smith VK2SPS**

Congratulations to VK2JSB in winning the novice CW section of the WIA 1993 Novice Contest, and to VK3EFO for taking out the AOCP CW section. A job well done by both. It's a little disappointing that this year's contest only drew in 34 entrants. Hopefully we can improve on this figure next year.

I would like to thank Mr Bird (VK3EDB), for the article from the Melbourne Sun Herald, dated 14 Sep 93, about a gentleman who was physically disabled, unable to speak and who, after eight years of frustrating silence, was able to speak with his "new voice — an electronic device he programs to speak for him by using Morse code which he transmits into a computer which translates the code into the spoken word. Sir, I take my hat off to you.

In this issue we will look at how the telegraph came to Australia, and what significant changes it made. It is interesting to note that, prior to this, Australia had a form of communication called "Semaphore". The Semaphore formed a visual telegraph that conveyed messages alphabetically by positioning of its two arms. The town of Semaphore, nine miles from Adelaide, is a contemporary reminder of its use. The drawbacks to this optical telegraph were rain, fog, mist and snow. It was labour intensive and totally ineffective at night.

It was nearly eight years after Morse tapped out his famous "What Hath God Wrought" that the telegraph came to Australia. A Canadian named Samuel McGowan (1829 — 1887), aged 24 at the time, brought telegraph technology to the colonies. McGowan, already an expert telegraphist and entrepreneur in the expanding North American telegraph industry, started his telegraph career in 1847 while studying under Samuel Morse.

When news of Victoria's gold discoveries reached North America in 1852, McGowan saw his opportunity, consulted his former instructor Professor Morse and embarked for the colonies of Australia.

In 1853 McGowan arrived in Melbourne, along with a first class electrician, several complete Morse sets, insulators, batteries and cable. This was the first transfer of modern telecommunications technology to Australia.

McGowan's plan was to develop a private company to construct and work telegraph lines from Melbourne to the Ballarat and Bendigo gold fields, and to link Victoria's golden capital with those of its neighbouring colonies.

As his company took shape, the Victorian Government stepped in and called for tenders for the construction of an experimental telegraph line, running from Melbourne to Williamstown, and indicated to McGowan that any independent approach would meet the utmost resistance. Confronted by bureaucratic red tape McGowan conceded to the Government, taking a leading position in the management of Public Telegraphy and also the contract for the eleven mile Melbourne — Williamstown telegraph line.

Australia's first telegraph line was completed with home made wooden poles and imported British galvanised wire.

On 3 March 1854 the first telegraph line in Australia opened. McGowan became General Superintendent of the new electric telegraph of Victoria. Nearly four thousand telegrams were despatched in the first year of operation. Two years later the figure had tripled, bringing in some five thousand pounds to Victoria's Electric Telegraph Company. Rates for telegrams at the time were set at 1 shilling and 6 pence (1s 6d) for the first ten words any distance under ten miles and increased for each ten miles.

Victoria was at the forefront of technology at the time, and other colonies became interested in Victoria's telegraph system. South Australia was the next colony to follow. Charles Todd (1826-1910) was made the first Superintendent of Telegraph, accepting office in February 1855, and arriving in Adelaide in November 1855 from Britain.

On the same day as Todd's arrival, a private contractor, James McGeorge, opened a line from Adelaide to its port, using his own equipment. Meanwhile Todd completed his telegraph line from Adelaide to Semaphore, which opened two months later in 1856. James McGeorge's earlier line was bought by the South Australian Government for eighty pounds and dismantled. The Adelaide — Melbourne telegraph line started in April 1857 and opened July 1858. (To be continued)

I would like to thank Peter Dance from the Telecom Historical Society for supplying the above information.

Overseas News

Chris G4BUE has become the first UK amateur to complete the 5 Band Worked all Zone Award, exclusively on CW. Congratulations Chris on a tremendous effort.

Merry Christmas to all — see you in January 1994.

**PO Box 361 Mona Vale NSW 2103* ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

E W (Eric)	CLEBURNE	VK2BII
D A	MCKINNON	VK2CDM
H (Hans)	SCHWITTER	VK2GKO
R K (Rex)	ROSEBLADE	VK2RR
C RUSSELL	WATT	VK2WT
E C (Edwin)	MANIFOLD	VK3EM
T	JENSEN	VK4NTJ

Ray Bennett VK5BT

On October 13, VK5BT lost to cancer and became a silent key. Our friendship began one morning in August 1991. That is not very long for a "ham radio friendship" but, for VK5BT and I, it was the beginning of a real relationship — a true "mate" as you-down under fellows would say. That first contact was very rough, with my 80 watt Atlas transceiver and a dipole antenna up 20 feet, but I did manage to hear that Ray had a daughter coming to Texas, so we set up a schedule for the next day, and the next, and the next, etc. (VK5BT's daughter and friend (Gayle and Marty) did find their way to Texas and we got to spend one weekend together.) We decided, in the words of Ray, to "persevere and the conditions would get better." Well, they did get better and I did have many, many more contacts over the next few years.

Ray and I became mates — in every sense of the word (at least as much as a Yank could understand the word). We shared about life. And that is what ham radio is all about for me. I go just as "psychotic" as the next DX hound when a new country shows up, but the real satisfaction in ham radio comes from getting to know the fellow on the other end. VK5BT and I finally settled on an every other day sked and eventually a weekly sked. For much of that time Lloyd (VK5TP — now a silent key) was with us and ZL1BJN (Capt'n Bill) and VK5PC (Denis) joined in.

This is to say goodbye to a mate — and to say that ham radio made his life fuller and more complete. He will be missed by people all over the world — and by a very loving and large family.

Ray began his "radio career" back in WWII. Ray was a radio operator and he served with the "Z Special Forces." Ray was very proud to have served his country and his military time and friendships developed were special to him.

I will miss Ray and so will many hams around the world. I was probably not the best person to write this note — but Ray was a good mate and I wanted to say goodbye.

Gary Stone N5PHT,
POB 305, Savoy, TEXAS 75479

Rex Roseblade VK2RR (formerly VK1QJ Canberra)

Rex was a retired Army Signals Brigadier of the 7th Division. He was involved in the Middle East, PNG, Japan and was a graduate from, and later an instructor at, Duntroon.

During a visit to Sydney in 1986 he lost a leg following an accident with a motorcyclist whilst crossing the Pacific Highway. Since then he has been in various hospitals and finally the War Veterans Nursing Home at Narrabeen. During this period he has been heard on HF and latterly the Terry Hills 2 m repeater.

Rex died on Friday morning the 8th October after a long illness. He leaves his wife Mary, and son Michael and family. Rex was aged 78 years.

Arthur Brown VK2IK

E C (Ed) Manifold VK3EM

Edwin Charles Manifold became a silent key on 1st November 1993. He was born on 31/1/08 and by the time he was 14 was taking an active interest in the mysteries of wireless. By August 1930 he had obtained his amateur licence, the call sign of VK3EM and was active until the outbreak of war.

After three attempts Ed was able to obtain release from his reserved occupation with what was then the Metropolitan Gas Co and get into the Wireless Maintenance Mechanics course No 21 at the Exhibition Building in Melbourne. On completion of the course he found himself in a number of locations, not the least of which was Darwin in time for the bombing raids. He recently expressed to me his regrets at being unable to go to Darwin for the 50th anniversary reunion of those who had been there at the time.

After the war Ed lost no time getting back "on air", his "new" licence being issued on 24/1/46 permitting operation on 28-29, 50-54, 166-170 and 1345-1425 "megacycles".

Ed was a foundation member of the Moorabbin and District Radio Club of which he was a life member. He was foundation treasurer in 1949 and retained the position during 1950 and 1951. He was elected president in 1955.

From June 1959 until December 1970, he was an active member of the WIA Publications committee, almost every circuit diagram used during this period was his work.

With the advent of the first 70 cm repeater in Melbourne, Ed found a new interest and whilst the rest of us were looking for commercial equipment to modify, Ed proceeded to produce a fine piece of homebrew gear, which now rests in the museum of the MDRC along with several other examples of his workmanship.

Ed was member No 23 of the RAOTC, but due to his failing health and the fact he had moved to a country location he let his membership lapse.

The world of amateur radio is the poorer for his passing.

Ken Pincott VK3AFJ ar

WICEN

News from WICEN (NSW) Inc

By now the Big NSW/VIC Bike Ride will be in full swing with WICEN personnel from both states providing safety communications for the many cyclists. The ride will finish on 12 December.

The Narrabeen Festival will be on the weekend of 4-5 December. Local co-ordinator Richard VK2SKY is arranging communications for this community event.

There are no more scheduled events for the year but, as usual, all personnel are warned to be ready for sudden activations. Disasters at this time of the year in the past include bush fires, storms and an earthquake. The holiday season also causes people to do silly and unpredictable things on the roads, so drive carefully. We'd like you to be around for next year.

Events notified for next year include the Worrigee Horse Trial on 13 March with David VK2BDJ in charge; and the now annual Goulburn Training Conference on the weekend of 14-15 May.

Finally, do not forget the Sydney 2000 Olympics! WICEN's involvement is unknown at this stage, but it will no doubt involve many personnel.

The address of WICEN (NSW) Inc is PO Box 123 St Leonards NSW 2065. WICEN (NSW) conducts nets at various times. The only one I know about is the Sydney VHF Net every Thursday night at 2130 local time on repeater 7150 in Chatswood.

Dave Horsfall VK2KFU
Publicity Officer WICEN (NSW) Inc.
ar

WIA News

October Board and Council Meeting

The WIA Federal Office hosted the October quarterly meeting of the Federal Board and Council over the weekend of the 16th and 17th. There was an informal meeting of the seven Councillors and attending alternates for one hour on the Saturday morning to plan the order of business and discuss particular items of interest.

The formal meeting opened at 1000 on Saturday and closed at 1500 on the Sunday. The Council considered a motion from VK3 which sought to change the way concessional membership fees are determined. Up till now, they were determined by applying a fixed discount of 20%, "split proportionally between the Executive and Divisional components."

The motion was carried; the intention and effect being that Divisions are no longer limited by a 1989 resolution, and 1992 amendment, in the way they determine concessional membership fees. This was the only business considered by Council.

The Board heard reports from Councillors, the new Federal Secretary, Bruce Thorne, and Federal Office manager, Donna Reilly, and the Federal International Regulatory coordinator, David Wardlaw VK3ADW. David was authorised by the Board to attend a Seminar on "Access to the Spectrum and the New Radiocommunications Act" on 1 November. No doubt we'll have a report on this in the fullness of time.

David also gave an extensive verbal report to the Board on numerous happenings on the international amateur radio scene. It is planned to have a summary of important items in January's WIA News.

Federal **WICEN Coordinator,** Leigh Baker VK3TP, advised Federal that he would continue in his position for another year. His decision was appreciated by the Board and the Federal Secretary has written to thank him.

Awards, contests and the issuing of certificates came up for discussion on the Board meeting's agenda. The Board resolved that the Contest Manager will in future sign contest certificates, but that all other coordination arrangements will remain unchanged.

The Federal Office provides support to the coordinators, Peter Nesbit VK3APN and John Kelleher VK3DP, sending certificates out to recipients and publishes results in *Amateur Radio magazine.* A congratulatory letter is sent to contestants, providing an avenue to promote the WIA to those who are not members and showing support to those who are. The procedures ensure a professional and reliable service to the Divisions, the members and amateurs in general.

Amateur Radio magazine, a topic under discussion at Federal quarterly meetings for over a year now, was discussed at length. Forward business from the July quarterly meeting included the questions of restaffing and an "editorial platform". The Board appointed a subcommittee to consider publishing options and policy for the magazine. Neil Penfold VK6NE was appointed Chairman, with Bill Wardrop VK5AWM and Roger Harrison VK2ZTB as members.

The subcommittee's terms of reference are:

1. To investigate existing magazine production procedures, compare and contrast with current publishing industry practices and make recommendations to the Board on future operations;
2. To investigate existing policies and procedures regarding selection and rejection of all editorial material, compare and contrast with current publishing industry practices and with current practices of like organisations and make recommendations to the Board on future policies and procedures; and
3. To develop and recommend to the Board an editorial platform for *Amateur Radio* magazine, to serve the interests of the WIA and its members.

A first report is to be produced by the subcommittee for circulation by 1 February 1994.

Roger Harrison VK2ZTB subsequently attended a Publications Committee meeting convened for 26 October to discuss the matters raised in the Board subcommittee's terms of reference. The Publications Committee detailed current practices and policies and provided considerable information for the subcommittee to consider.

Under **General Business,** the Board decided that the Spectrum Management Agency (SMA) should be approached to consider longer licence renewal periods, of perhaps three to five years, rather than the annual renewal, as presently applies. In addition, the SMA is to be asked to consider licence payments and renewals by credit card (ie phone up and "pledge your plastic" at renewal time), and to organise payments through agencies, such as Post Offices.

There was also discussion on recent problems with the content of packet radio messages.

Support the WIA in order to protect Amateur Radio frequencies.

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

μV in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 41.2. The predicted value for January is 39.1 and for February it is 37.3

ar

VK EAST — MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.0	-7	6.9	0	-12	-27	...	...
2	8.6	-16	6.6	-1	-12	-26	...	...
3	12.0	-5	9.3	0	-2	-10	-23	...
4	18.7	4	14.4	-2	4	3	-2	-10
5	25.5	7	19.5	-6	6	9	8	4
6	26.9	9	20.9	-8	6	10	10	8
7	26.3	10	21.2	-7	7	11	11	9
8	25.9	11	21.1	-4	8	12	12	9
9	25.3	12	21.0	1	12	14	13	9
10	24.5	15	19.8	11	17	18	15	10
11	23.8	18	19.1	21	23	21	16	10
12	23.1	21	18.5	30	28	24	18	10
13	22.7	24	18.1	37	32	27	19	10
14	22.2	25	17.5	39	33	27	18	9
15	21.4	24	17.0	39	31	24	14	4
16	19.6	23	14.7	37	27	18	6	-7
17	17.8	24	13.3	34	23	13	-1	-16
18	16.6	25	12.4	32	20	9	-6	-24
19	15.7	26	11.6	31	17	5	-11	-30
20	14.6	27	10.8	28	14	0	-18	-39
21	13.6	25	10.0	23	8	-5	-25	...
22	12.7	21	9.8	17	5	-8	-28	...
23	12.8	15	9.6	13	3	-9	-27	...
24	11.3	7	8.6	6	-3	-16	-36	...

VK EAST — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.5	28	22.8	35	37	35	31	26
2	28.3	28	23.4	36	37	36	32	28
3	28.5	28	23.4	37	38	36	33	28
4	28.1	29	23.0	38	39	37	33	28
5	27.4	29	22.3	40	40	37	33	27
6	26.8	30	21.8	43	41	38	33	27
7	26.0	32	21.0	48	44	40	34	27
8	25.1	33	20.2	50	45	40	33	26
9	24.3	34	19.5	50	45	40	32	24
10	23.5	34	18.8	51	45	39	31	23
11	23.1	35	18.3	51	44	39	31	22
12	22.4	35	17.7	51	44	38	29	20
13	21.5	36	16.9	50	43	36	27	18
14	20.1	37	15.7	49	41	34	24	13
15	18.7	38	14.5	48	39	31	20	8
16	17.4	39	13.3	46	37	28	15	3
17	16.5	39	12.5	45	35	25	12	-1
18	17.0	38	12.9	44	35	26	14	1
19	19.3	34	14.5	41	36	29	20	9
20	22.2	31	16.9	39	37	33	26	17
21	24.3	30	18.8	38	37	34	29	22
22	24.8	29	19.5	36	36	34	29	22
23	25.3	29	20.3	35	36	34	29	23
24	26.2	28	21.4	35	36	34	30	24

VK EAST — AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.1	11	11.2	10	10	5	-4	-15
2	15.3	7	11.7	6	7	2	-6	-18
3	15.7	4	11.9	2	5	2	-5	-16
4	17.8	5	13.4	-1	5	4	0	-8
5	19.7	6	13.8	-4	5	6	2	-3
6	19.5	5	13.7	-5	4	5	2	-4
7	19.5	5	13.7	-5	4	5	2	-4
8	19.4	6	13.6	-4	5	5	2	-4
9	19.4	7	13.5	-1	6	6	2	-4
10	19.2	9	13.4	3	9	8	3	-4
11	19.2	11	13.4	8	12	10	4	-4
12	18.5	13	13.6	12	14	10	3	-5
13	17.9	16	13.4	17	16	11	2	-8
14	17.3	19	13.0	22	18	12	2	-10
15	16.7	24	12.5	28	20	12	0	-13
16	15.8	27	12.0	30	20	11	-3	-18
17	15.0	28	11.5	30	19	8	-7	-24
18	14.5	29	11.0	30	18	6	-10	-28
19	14.4	30	10.6	31	18	6	-11	-29
20	14.9	29	10.2	31	19	8	-8	-25
21	14.3	25	9.8	25	15	4	-11	-29
22	13.9	21	9.6	20	12	1	-13	-31
23	14.0	16	9.7	16	10	1	-13	-29
24	14.6	13	10.2	13	9	2	-9	-23

VK EAST — EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.7	-3	7.6	1	-10	-24	...	...
2	8.7	-12	6.8	0	-12	-26	...	...
3	8.2	-18	6.5	-1	-12	-26	...	...
4	9.4	-14	7.2	0	-7	-19	-37	...
5	12.3	-5	9.8	0	-1	-8	-21	-37
6	16.4	2	13.1	-1	3	0	-7	-18
7	19.9	6	16.0	-1	6	6	1	-6
8	22.7	9	18.3	2	10	10	6	0
9	24.4	12	19.8	9	15	15	11	5
10	24.1	17	19.4	22	23	21	16	9
11	23.3	21	18.7	31	28	24	17	9
12	22.7	22	18.1	35	30	25	17	7
13	21.9	21	17.4	37	30	23	13	1
14	19.0	23	15.2	35	25	16	3	-11
15	16.0	25	12.7	31	17	5	-12	-31
16	13.1	27	10.7	23	5	-11	-34	...
17	11.2	28	8.8	15	-7	-29	...	...
18	9.8	29	7.7	6	-20	...	...	...
19	9.2	30	7.2	2	-27	...	...	...
20	8.9	30	6.9	0	-31	...	...	...
21	8.8	24	6.8	0	-29	...	...	...
22	9.1	16	7.2	1	-22	...	...	...
23	9.7	8	7.5	3	-14	-32	...	...
24	10.1	3	7.9	3	-10	-25	...	...

VK EAST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.4	5	13.1	1	4	2	-5	-16
2	15.2	5	11.5	4	3	-2	-13	-27
3	13.7	6	10.3	6	2	-6	-21	-38
4	12.9	9	9.7	9	1	-10	-27	...
5	12.3	14	9.2	11	0	-14	-34	...
6	11.8	19	8.8	13	-2	-19	...	...
7	11.5	25	8.7	15	-4	-23	...	...
8	11.7	27	8.8	17	-2	-21	...	...
9	11.8	28	8.9	18	-2	-21	...	...
10	10.9	29	8.3	14	-9	-30	...	...
11	9.3	31	7.1	4	-24	...	...	...
12	8.8	31	6.8	0	-30	...	...	...
13	11.1	29	8.3	15	-6	-28	...	...
14	11.8	29	9.1	19	0	-18	...	...
15	11.6	24	9.0	15	-2	-19	...	...
16	15.8	18	12.0	20	13	4	-10	-26
17	16.1	14	12.3	14	12	6	-3	-16
18	16.6	10	12.6	7	9	5	-2	-13
19	18.8	8	14.2	0	7	7	2	-5
20	21.7	8	16.6	-4	6	8	6	1
21	23.7	7	18.4	-7	5	8	7	3
22	24.2	7	19.1	-8	5	8	7	3
23	23.2	6	17.6	-7	4	6	4	-1
24	20.4	5	15.4	-3	5	5	0	-7

VK EAST — ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.1	15	21.1	17	21	21	17	11
2	26.6	15	21.2	15	21	21	17	12
3	27.9	14	22.0	15	21	21	18	13
4	28.9	13	22.1	16	22	22	19	14
5	29.5	14	22.8	18	24	23	21	16
6	28.5	17	23.4	21	26	25	22	17
7	27.5	18	22.4	25	28	26	22	16
8	26.5	19	22.1	32	31	28	22	15
9	25.6	21	20.7	39	35	30	23	15
10	24.7	22	19.9	41	36	30	22	13
11	24.1	23	19.3	42	36	30	21	12
12	24.0	21	18.5	42	35	28	19	8
13	22.6	21	17.2	42	33	25	14	2
14	20.6	22	15.6	40	29	20	7	-6
15	18.8	23	14.4	37	25	14	0	-17
16	17.6	23	13.3	34	21	9	-7	-26
17	16.4	24	12.5	32	17	3	-15	-36
18	14.4	25	11.0	26	8	-9	-33	...
19	11.6	27	8.9	13	-13	-37	...	...
20	11.4	26	8.9	11	-14	-39	...	...
21	15.8	20	12.0	24	12	-1	-19	...
22	22.9	16	17.7	28	25	20	12	2
23	24.5	17	19.5	23	24	22	16	9
24	24.9	16	20.1	19	22	21	16	9

VK EAST — EUROPE (Long Path)

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.4	-11	7.1	0	-6	-17	-35	...
2	10.0	-4	7.6	2	-6	-17	-34	...
3	10.4	0	8.0	3	-5	-16	-34	...
4	10.0	3	7.7	4	-7	-20	...	...
5	9.0	6	7.0	2	-13	-31	...	...
6	8.5	10	6.7	1	-18	-39	...	...
7	9.7	23	7.7	8	-12	-32	...	...
8	12.8	24	10.2	20	5	-9	-29	...
9	14.3	25	10.9	25	15	4	-11	-28
10	14.5	17	11.0	18	11	3	-9	-23
11	17.5	11	13.8	10	11	8	1	-8
12	18.3	7	14.5	1	7	7	2	-4
13	17.6	3	14.2	-5	3	4	0	-6
14	16.6	-1	12.9	-9	0	1	-2	-8
15	15.7	-6	12.1	-11	-1	0	-4	-10
16	15.1	-8	11.5	-12	-2	-1	-5	-12
17	14.9	-9	11.2	-12	-2	-1	-5	-12
18	15.6	-6	11.6	-12	-2	-1	-5	-13
19	13.6	-10	10.6	-8	-2	-4	-10	-20
20	11.6	-16	9.0	-5	-2	-6	-15	-27
21	10.1	-20	7.8	-2	-3	-9	-21	-36
22	9.5	-21	7.3	-1	-4	-12	-25	...
23	9.1	-20	7.0	0	-5	-14	-30	...
24	9.1	-16	6.9	0	-6	-17	-33	...

VK SOUTH — AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.5	15	11.8	16	13	7	-2	-14
2	17.0	13	12.8	12	12	7	-1	-12
3	19.4	12	14.1	9	12	10	4	-4
4	19.5	10	14.0	4	10	9	4	-3
5	19.4	8	13.9	1	8	7	3	-3
6	19.4	7	13.8	0	7	7	3	-3
7	19.3	7	13.7	-1	6	6	2	-4
8	19.4	7	13.8	0	7	7	3	-4
9	19.8	9	14.1	1	8	8	4	-2
10	19.6	10	13.9	4	10	9	4	-2
11	19.2	12	13.6	8	12	10	4	-3
12	18.5	14	13.0	13	14	11	3	-5
13	17.8	16	12.4	17	16	11	2	-8
14	17.0	19	11.8	21	17	11	1	-11
15	16.6	23	11.5	27	20	12	0	-13
16	15.9	26	11.0	30	21	11	-2	-18
17	15.3	28	10.6	31	20	9	-5	-22
18	14.8	29	10.3	31	19	7	-8	-26
19	14.6	30	10.3	31	18	6	-9	-27
20	14.9	30	10.6	32	20	8	-7	-25
21	15.2	27	10.5	29	19	8	-6	-23
22	14.9	24	10.4	25	16	6	-8	-24
23	15.0	21	10.5	22	14	5	-7	-23
24	15.7	18	11.1	19	14	7	-4	-18

VK — SOUTH — ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.5	13	16.4	12	15	13	6	-1
2	20.8	13	16.9	10	14	12	7	-1
3	21.3	13	17.6	10	14	13	8	0
4	21.4	13	17.7	10	15	13	8	1
5	21.4	14	17.6	11	16	14	9	1
6	21.2	15	17.3	14	17	14	9	1
7	20.9	16	17.0	17	19	15	9	0
8	20.8	18	16.9	23	22	18	10	0
9	20.5	23	16.6	34	28	21	12	0
10	20.0	25	16.1	37	29	21	10	-1
11	19.4	25	15.6	38	29	20	9	-4
12	18.8	26	15.0	38	28	19	6	-7
13	18.2	26	14.5	37	27	17	3	-12
14	17.7	23	13.7	34	22	10	-6	-24
15	16.5	22	12.6	30	16	2	-17	-38
16	15.4	23	11.7	28	11	-4	-26	...
17	14.5	23	11.1	24	6	-11	-35	...
18	12.7	24	9.8	17	-6	-28	...	...
19	10.2	25	7.9	0	-33	...	...	...
20	10.1	25	7.8	-2	-36	...	...	...
21	14.1	18	10.6	18	2	-14	-37	...
22	18.5	19	14.0	24	20	13	2	-10
23	19.9	16	15.4	18	18	14	6	-3
24	20.3	14	16.0	14	16	13	6	-2

VK SOUTH — USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.1	5	14.4	0	5	4	-1	-9
2	16.6	6	12.6	4	5	1	-7	-19
3	15.1	7	11.4	7	5	-1	-13	-28
4	14.2	10	10.7	10	5	-4	-18	-35
5	13.5	14	10.2	13	4	-7	-24	...
6	12.8	18	9.6	15	2	-11	-31	...
7	12.3	22	9.4	17	1	-15	-37	...
8	12.4	25	9.3	19	1	-15	-39	...
9	12.3	27	9.3	20	1	-16	...	...
10	11.1	29	8.5	15	-6	-27	...	...
11	9.2	31	7.1	4	-24	...	...	...
12	8.7	31	6.7	0	-30	...	...	...
13	11.5	29	8.6	17	-3	-23	...	...
14	13.4	29	10.3	26	10	-4	-24	...
15	13.6	23	10.4	22	9	-3	-21	...
16	16.0	18	12.2	20	15	8	-2	-16
17	15.7	11	11.8	11	10	5	-4	-16
18	16.4	7	12.3	4	7	4	-2	-12
19	18.4	6	14.5	-2	6	6	1	-5
20	20.7	7	15.5	-6	5	7	5	0
21	22.3	7	17.0	-9	4	7	6	2
22	22.9	7	17.8	-10	3	7	7	3
23	23.2	7	18.4	-9	4	7	6	2
24	22.0	6	16.7	-4	5	6	3	-2

VK WEST — EUROPE (Long Path)

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.6	-36	6.6	-10	-16	-27	...	...
2	9.2	-18	7.1	-2	-9	-19	-35	...
3	9.4	-13	7.3	-2	-9	-20	-38	...
4	9.0	-12	7.0	-2	-12	-25	...	...
5	7.9	-12	6.2	-4	-18	-34	...	...
6	7.5	-10	5.9	-6	-24	...	...	...
7	8.2	0	6.5	-4	-22	...	...	...
8	10.5	10	8.3	4	-10	-26	...	...
9	13.8	15	11.1	14	4	-7	-24	...
10	13.3	17	10.3	16	5	-6	-23	...
11	11.3	16	8.7	10	-4	-18	-39	...
12	11.4	9	8.8	7	-3	-15	-34	...
13	15.3	6	11.7	6	4	-1	-11	-23
14	16.7	3	11.4	-1	4	2	-3	-11
15	16.0	-2	11.1	-7	0	0	-5	-13
16	15.3	-7	10.4	-11	-2	-2	-7	-14
17	14.6	-11	10.0	-12	-4	-4	-8	-16
18	14.2	-11	9.8	-11	-4	-6	-12	-21
19	11.8	-18	9.3	-8	-5	-8	-17	-29
20	9.9	...	7.8	-21	-19	-26	-39	...
21	8.6	...	6.8	-32	-34	...	...	...
22	8.2	...	6.4	-34	-38	...	...	...
23	8.0	...	6.2	-30	-36	...	...	...
24	8.2	...	6.3	-22	-28	...	...	...

VK SOUTH — EUROPE (Long Path)

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	26.5
1	8.9	-13	6.8	0	-9	-21	...	...
2	9.5	-7	7.3	0	-9	-21	...	...
3	9.8	-1	7.5	1	-9	-23	...	...
4	9.4	1	7.3	1	-12	-28	...	...
5	8.3	3	6.5	-2	-21	...	...	...
6	7.8	8	6.2	-5	-29	...	...	...
7	8.7	16	6.9	0	-23	...	...	...
8	11.2	22	8.9	12	-5	-24	...	...
9	14.1	24	10.9	24	11	-1	-18	-38
10	11.4	22	8.8	14	-1	-18	...	...
11	11.2	15	8.6	11	-2	-17	-38	...
12	15.3	12	11.7	12	8	2	-9	-23
13	16.2	7	11.5	5	8	5	-2	-11
14	15.5	1	10.7	-2	3	1	-4	-13
15	14.8	-4	10.3	-6	0	0	-6	-14
16	14.4	-8	10.1	-9	-1	-1	-6	-15
17	14.5	-9	10.3	-10	-1	-1	-6	-14
18	15.2	-6	10.8	-9	-2	-3	-8	-17
19	12.4	-13	9.8	-6	-2	-5	-14	-25
20	10.5	-32	8.2	-12	-11	-17	-29	...
21	9.1	...	7.1	-19	-21	-31	...	...
22	8.6	...	6.7	-18	-23	-35	...	...
23	8.4	...	6.5	-13	-20	-32	...	...
24	8.5	-25	6.5	-4	-12	-24	...	...

VK WEST — AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.3	19	11.7	21	14	5	-8	-23
2	15.7	16	11.9	17	12	5	-6	-20
3	17.8	14	14.0	13	13	9	0	-10
4	20.8	12	16.0	10	14	12	6	-1
5	21.0	11	15.5	6	12	11	7	0
6	20.9	10	17.2	4	11	10	6	0
7	20.8	10	17.1	3	10	10	5	-1
8	20.7	10	16.9	3	10	9	5	-1
9	20.5	10	16.7	4	10	10	5	-1
10	20.7	11	16.8	6	12	11	6	-1
11	20.5	12	16.9	9	13	12	6	-1
12	20.0	15	16.1	15	16	13	6	-2
13	19.4	17	15.5	20	19	14	6	-3
14	18.7	20	14.9	25	21	15	5	-6
15	18.0	24	14.3	31	24	16	4	-8
16	17.4	26	13.8	34	24	15	3	-11
17	16.8	27	13.6	34	24	14	0	-15
18	15.9	29	12.4	33	22	11	-3	-20
19	15.1	30	11.7	33	20	8	-8	-26
20	14.6	30	11.2	31	18	6	-11	-30
21	14.5	30	11.0	31	18	5	-12	-31
22	15.2	30	11.4	33	20	8	-8	-25
23	15.3	27	11.7	30	19	8	-7	-24
24	14.9	24	11.3	25	16	5	-9	-26

VK WEST — MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.3	5	6.4	-6	-30	...	...	...
2	7.9	-6	6.1	-7	-28	...	...	...
3	11.2	0	8.3	1	-7	-20	...	...
4	17.6	6	13.6	5	6	2	-7	-18
5	22.8	9	17.1	2	10	10	7	1
6	23.2	8	17.8	-1	8	9	7	1
7	23.3	9	18.7	-2	6	10	7	3
8	23.1	9	18.8	-2	8	10	8	3
9	22.7	10	18.5	0	9	10	8	3
10	22.6	11	18.3	3	11	12	9	3
11	22.2	13	18.4	9	15	14	10	3
12	21.6	16	17.4	19	20	17	11	3
13	21.0	21	16.9	30	26	21	12	3
14	20.4	24	16.3	35	28	22	12	1
15	19.9	23	15.8	36	28	20	9	-3
16	18.7	21	14.1	34	23	13	0	-16
17	17.0	23	12.8	32	19	7	-8	-26
18	15.9	24	11.9	30	16	3	-15	-35
19	15.1	25	11.2	28	12	-1	-21	...
20	14.0	25	10.4	25	8	-8	-29	...
21	13.0	26	9.8	21	2	-15	-39	...
22	12.5	27	9.4	20	0	-18	...	...
23	12.0	24	9.1	16	-3	-22	...	...
24	10.6	18	8.0	7	-13	-33	...	...

VK SOUTH — MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.0	-4	6.9	0	-15	-31	...	...
2	8.5	-14	6.6	-2	-14	-30	...	...
3	12.4	-3	9.2	0	-2	-10	-23	...
4	19.7	5	15.2	-1	5	5	0	-7
5	22.7	9	18.7	-6	6	9	8	4
6	22.6	8	18.5	-8	4	8	7	3
7	22.4	7	18.3	-9	4	7	6	3
8	22.3	8	18.1	-7	5	8	7	3
9	22.5	9	18.2	-4	7	9	8	4
10	22.2	11	18.0	1	10	12	9	4
11	21.7	14	17.5	11	16	15	11	4
12	21.0	18	16.9	21	21	18	12	4
13	20.3	23	16.2	31	27	21	13	3
14	19.6	25	15.5	35	28	21	12	0
15	19.0	26	15.0	36	28	21	10	-1
16	18.2	27	14.4	36	28	19	8	-5
17	17.3	28	13.5	36	26	17	4	-10
18	16.4	29	12.7	34	24	13	0	-16
19	15.8	28	12.1	33	21	10	-5	-22
20	15.6	26	11.7	30	17	5	-12	-31
21	14.5	25	11.0	27	12	-1	-20	...
22	14.0	22	10.4	21	8	-4	-23	...
23	13.3	18	10.0	16	5	-8	-26	...
24	11.6	10	8.8	8	-3	-17	-37	...

VK WEST — ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.8	16	18.9	19	22	20	14	7
2	24.1	16	19.5	17	20	19	14	8
3	25.1	15	20.5	16	20	20	16	10
4	26.5	15	20.2	16	21	21	17	12
5	27.6	15	21.4	16	22	22	19	13
6	27.9	16	22.1	18	24	23	20	15
7	27.6	17	22.7	21	25	25	21	16
8	26.9	18	22.0	25	27	26	21	15
9	26.2	20	21.3	33	32	28	22	15
10	25.3	22	21.1	41	36	31	23	15
11	24.6	23	19.8	43	37	31	22	13
12	23.8	24	19.1	43	36	30	21	11
13	23.2	24	18.4	43	36	29	19	9
14	22.5	21	17.1	42	33	25	14	2
15	20.4	22	15.5	39	29	19	6	-7
16	18.7	22	14.1	36	24	13	-2	-19
17	17.4	23	13.2	34	20	7	-10	-29
18	16.2	23	12.4	31	15	1	-19	...
19	14.3	24	11.0	24	5	-13	-38	...
20	11.6	25	8.9	10	-17	...	...	...
21	11.4	25	8.8	9	-19	...	...	...
22	15.7	21	12.2	26	12	-2	-22	...
23	21.7	18	16.7	27	24	19	11	1
24	23.6	17	18.4	23	24	21	15	7

VK WEST — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.4	15	17.8	13	18	16	11	4
2	22.4	15	18.2	13	17	16	11	4
3	22.7	15	16.8	14	18	17	12	5
4	22.7	16	18.6	15	19	17	12	5
5	22.5	16	18.5	18	20	18	13	5
6	22.4	18	18.3	21	22	19	13	5
7	22.2	20	18.1	27	25	21	14	6
8	22.4	22	18.2	32	29	24	16	7
9	22.2	24	18.2	37	32	26	17	7
10	21.6	25	17.4	40	33	26	17	6
11	21.0	26	16.8	41	33	25	15	4
12	20.2	27	16.1	41	32	24	13	2
13	19.5	28	15.5	41	31	23	11	-1
14	18.9	28	14.9	40	30	21	9	-3
15	18.1	29	14.1	39	29	19	6	-7
16	16.9	30	13.0	37	26	16	1	-14
17	16.1	30	12.2	36	24	13	-2	-19
18	15.7	30	11.9	34	22	11	-4	-21
19	15.4	26	11.7	29	19	8	-6	-22
20	16.2	22	12.1	24	18	9	-3	-17
21	18.1	19	14.2	21	19	13	3	-8
22	20.2	17	15.2	18	19	15	8	-1
23	21.7	16	16.7	16	19	16	11	3
24	22.2	15	17.3	14	18	16	11	4

VK SOUTH — SOUTH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.5	18	15.0	21	19	13	2	-9
2	18.7	18	15.4	22	19	13	3	-9
3	18.6	19	15.3	23	20	13	3	-9
4	18.5	19	15.2	24	20	14	3	-9
5	18.4	21	15.0	26	21	14	3	-10
6	18.3	22	14.9	29	23	15	3	-10
7	18.4	25	14.9	34	26	17	4	-10
8	18.2	27	14.7	38	28	18	4	-11
9	17.8	28	14.3	38	27	17	2	-13
10	17.3	29	13.8	38	26	15	0	-17
11	16.7	30	13.3	38	25	13	-3	-21
12	16.1	30	12.8	37	23	10	-7	-26
13	15.6	31	12.3	35	21	8	-10	-30
14	15.0	31	11.8	34	19	5	-14	-35
15	14.2	31	10.9	31	14	-1	-22	...
16	13.4	32	10.2	29	10	-6	-29	...
17	12.9	33	9.8	27	8	-9	-33	...
18	12.7	31	9.6	25	7	-10	-34	...
19	13.3	25	9.9	22	8	-6	-27	...
20	14.8	21	11.0	22	13	1	-15	-34
21	16.5	20	12.4	23	17	8	-5	-21
22	17.7	19	13.6	23	19	11	0	-13
23	18.2	19	14.2	22	19	12	2	-11
24	18.5	18	14.7	22	19	13	2	-10

VK WEST — EUROPE

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.7	11	8.3	5	-10	-27	...	...
2	9.7	2	7.5	0	-15	-32	...	...
3	9.2	-6	7.2	-1	-15	-31	...	...
4	10.8	-5	8.2	0	-7	-19	-37	...
5	14.7	1	11.8	0	1	-4	-15	-29
6	19.7	5	15.8	-1	5	4	0	-9
7	23.5	7	18.9	-3	6	8	5	0
8	25.9	8	21.1	-4	7	10	9	5
9	25.4	10	20.7	-3	9	11	11	7
10	25.1	12	20.4	1	11	13	12	8
11	24.5	14	20.3	7	15	16	13	8
12	23.8	17	19.2	19	22	20	16	9
13	23.1	20	18.5	31	28	23	16	7
14	21.5	19	17.1	34	27	20	10	-1
15	18.3	21	14.4	32	22	12	-1	-16
16	15.2	24	12.4	27	13	0	-18	-39
17	13.1	26	10.2	22	4	-13	37	...
18	11.5	28	8.9	15	6	-27	...	...
19	10.8	28	8.3	11	-12	-35	...	...
20	10.2	29	7.8	8	17	...	...	...
21	9.9	29	7.5	6	-20	...	...	...
22	10.1	29	7.9	7	-19	...	...	...
23	10.7	24	8.1	10	-12	-34	...	...
24	11.2	18	8.6	10	-7	-26	...	...

VK WEST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.2	2	13.0	-4	3	2	-3	-11
2	14.9	1	11.3	-1	3	0	-8	-20
3	13.4	0	10.1	2	2	-3	-14	-28
4	12.6	2	9.4	4	2	-6	-19	-36
5	12.0	5	9.0	7	1	-9	-25	...
6	11.4	9	8.5	9	0	-13	-31	...
7	11.2	14	8.5	11	-1	-16	-37	...
8	11.5	20	8.6	15	0	-15	-38	...
9	11.7	27	8.9	19	1	-15	-39	...
10	10.9	30	8.3	17	-4	-23	...	...
11	9.4	32	7.2	9	-17	...	...	...
12	8.9	33	6.9	6	-22	...	...	...
13	11.2	31	8.3	19	-1	-21	...	...
14	14.6	30	11.3	31	18	5	-12	-32
15	12.5	28	9.6	23	8	-6	-27	...
16	12.8	21	9.8	19	7	-5	-23	...
17	16.7	17	12.9	18	15	9	-1	-13
18	16.0	13	12.2	11	12	8	0	-11
19	15.6	7	11.9	4	8	5	-2	-12
20	16.4	4	12.3	-1	6	5	0	-8
21	18.4	5	14.5	-6	4	6	3	-3
22	20.7	6	15.7	-11	3	6	5	1
23	22.2	6	17.1	-11	3	6	5	1
24	20.2	5	15.3	-8	3	5	2	-4

HAMADS

TRADE ADS

• AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne.

• WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35-00, is a high resolution shortwave weatherfax, morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3-00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE NSW

• SIERRA Bi-directional power monitor, 10-500 watts, 25-250 MHz $190. John VK2ZHM QTHR (02) 417 5338.

• ICOM 275H 100 watt s/n 02293 allmode with box h/book ect as brand new very little use selling only to update to Satellite. Top buy for anyone wanting as as new all mode $1550 and will give buyer a brand new 100 watt pre-amp, buy your wife a Xmas present. A. Walsh VK2TBW (048) 61 2092 phone or (048) 61 1536 fax.

FOR SALE VIC

• SEASIDE QTH 3 bdr modern brick plus shack, bay view, Nally Tower, top uhf/vhf area. Ted VK3TG QTHR (052) 59 3225.

• KENWOOD TS930S HF xcvr excellent condition $1650; YAESU FL2100B linear amp, tubes 50% $500; KENWOOD TS520S HF xcvr good condition $500 all mikes and manuals. Geoff VK3ACZ QTHR (050) 24 5987.

• 70 CM PA mml 432/50 $175 ONO; OSKER BLOCK SWR $30. Ted VK3TG (052) 59 3225.

• YAESU FT757 GX HF xcvr s/n 6K380271 all WARC bands, cont/cover RX 500 KHz — 30 MHz $950; BEAM 8 el, log/periodic, cont/cover 13-30 MHz $425; YAESU FT7 xcvr 80-10m s/n 8K110595 $385. All in good condition complete with instruction books etc. Bob VK3AQK QTHR (057) 44 1676.

FOR SALE QLD

• SELL OR SWAP 10x4CX25OB+SK620 sockets and chimneys, 2x4CX1000K+K socket, 3x4CX3500A+socket, 1xTL236 ceramic 1000w 1000MHz, 4/125A 4/250+sockets, 2x4CX10000A+K socket, Fil+ xformers, Xmas tree stacks + HV caps, 2xAM17A lin or class-C 300-600w 70-140 MHz etc QRO stuff need good Txcvr. Paul VK4DJ (077) 75 5089 or 79 6861.

WANTED NSW

• COMPLETE 1970-1990 issues of CQ, Ham Radio and 73 Magazine. For swap 1948-1989 issues of QST. VALVE tester complete with manual and valve data. Tom VK2OE (046) 21 2228 evenings.

• COLLINS Transceiver KWM-2 any condition but cheap. Peter VK2CPK QTHR (02) 605 4790.

• VHF Communication magazine 1988 thru 1993 (English). William VK2AVH (02) 569 1573.

• EARLY TRIODES Tetrodes Pentodes KT88, KT66, KT77, KT61, EL34, 6CA7, 300B, 6L6, 845, VT-4C, 6B4G, early wireless and valve amplifier parts, literature etc. John (02) 488 8184.

WANTED VIC

• CIRCUIT and any info avail on Heathkit model GR78 transistor 6 band comm recvr; GALAXY III any condition any parts of. A. C. Styles VK3TV RMB 2943 Benalla Vic 3673, (018) 57 3405.

• 18AVT/WB vert antenna also prop pitch motor any condition. A. Greening VK3PA (054) 68 1088.

• 100 kHz crystal for repair of FT620 transceiver. Mike VK3XL (03) 703 2729 AH or 660 4310 BH.

• WA SKYRANGER HC-5-D 5 channel HF xcvr tech info manual. All costs reimbursed. John VK3CJB QTHR (053) 39 1014.

• COLLINS 51S-1, 75A-4, 75S-3B. Must be in exc cond. Susumu VK3ERR QTHR (03) 598 0282 after 7.00 pm.

WANTED QLD

• POWER Supply nominal 12 volts at 20 to 30 amps rating, prefer non switching model supply in good condition. John VK4TJB (07) 279 2464.

• HOUSE on acreage in SE-VK4 must have good location for DX, masts, antennas etc welcome. Peter VK4GPS (075) 39 4465.

WANTED WA

• HALLICRAFTERS SX100 receiver manual/circuit (or copies) also bandsread tuning knob all costs reimbursed. Dave VK6DX QTHR (09) 457 5749.

MISCELLANEOUS

• HAVING A SHACK CLEAN-OUT? Please contact Ken, VK3TL about collecting those QSL cards that haven't been looked at for years. We especially need DX cards but all are welcome. We need also USA QSLs to complete our US county collection. Please phone (03) 728 5350 or write to Ken Matchett, Hon. Curator, WIA QSL Collection at 4 Sunrise Hill Rd, Montrose VIC 3765.

ar

UPDATE

A Simple 300/1200 Baud Packet Radio Modem

In the 300/1200 baud modem article by VK3AQZ, which appeared on page 4 of the November 1993 issue of *Amateur Radio*, there was a small error in the wording of the addendum (page 11). After "DIN socket (J2)" it should read "and the wiper of VR3". (The word "top" is replaced by "wiper").

Make sure you amend your copy of the original article now!

Digicom with an AAPRA Modem

With reference to this article, which was published on page 26 of the November 1993 issue of *Amateur Radio*, an error has been pointed out by Helmut Neumann VK3CHN. Helmut built up the adaptor as described and connected it. However, when he switched on the C64 it immediately "went dead"! The 1 A fuse inside the computer had blown.

The reason is that pins 10 and 11 of the user I/O port have 9 V AC on them. The adaptor connects pin 10, via 12, 1 on the modem to GROUND! All that needs to be done is to remove the connection to pin 10.

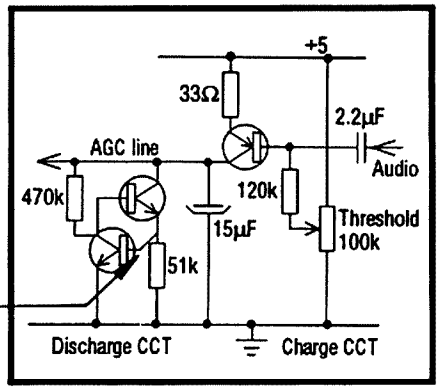
Helmut hopes that other "packeteers" have not been caught similarly. If the 1 A fuse has been replaced (wrongly) with a higher value, as he has seen in some cases, it can make "quite a mess of the PC board", which itself becomes an expensive fuse!

Make sure you amend your copy of the original article now!

"Update" *(contd. from page 54)*
Jon Linstad VK2WK articles

We have been advised by Jon Linstad, VK2WF, that an error occurred in each of his articles published in the November issue of Amateur Radio magazine. Please amend your copies as follows:

a. P 13, col 2, line 2, — 4999.8 kHz (+/– 200 Hz) should read 4999.8 kHz (– 200 Hz).
b. P 24, circuit diagram, — the base of the first transistor should connect to a point between the emitter of the second transistor and the 51 k resistor (see diagram).



Make sure you amend your copy of the articles now.

Editor's Comment
Continued from page 3

some Councillors were appointed rather than elected? Could it be that only a tiny minority actually had a vote? If the answer to the last three question is "Yes", does it matter? If you, the members, think it does matter, then let your opinions be known. You may well ask "how?" A good way to start is by writing to your Divisional President pointing out those aspects of the Divisional management which you see to be undemocratic, unfair, unjust or wrong. Perhaps you may be quite satisfied with your Division. If so, tell the President so. He (she) will appreciate your support. But don't rust away in the silent majority. You have a democratic right to be heard!

Traditional good wishes for Christmas and the New Year.

Bill Rice VK3ABP
Editor
ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
•Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
•Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
•Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
•QTHR means address is correct as set out in the WIA current Call Book.

•WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
•Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: .....Address: .....

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:
Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958
MAIL DISTRIBUTION:
R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.950 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WSS Tuesday at 0930 UTC on 3535 kHz

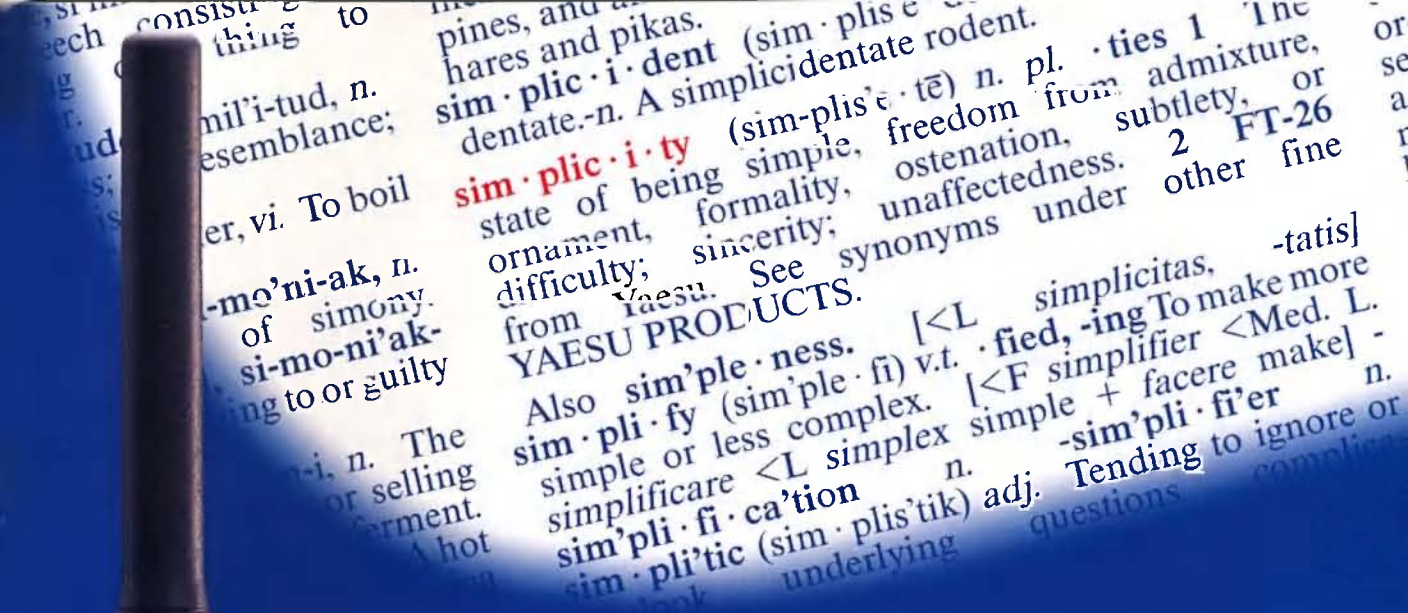
VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6WIA Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz.



Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yoesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard!
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 55(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

A simply brilliant price

Cat D-3600

$449

YAESU

'Quality and Reliability You Can Afford'

DICK SMITH ELECTRONICS

ICOM

Count on us!

Ham heaven.

Some days Duncan thinks that he must have died and gone to heaven. Whichever way he turns he is surrounded by the finest ham radios around. What's a guy to do? He plays with them all day. And if that wasn't good enough, he gets paid for it as well.

Duncan Baxter... well VK 3LZ actually, let's call him by his 'real' name, is our resident ham radio expert. No one knows the Icom range better than VK 3LZ. He's been with us virtually from the start, some ten years in fact.

Now, if you'd like to find out about the latest in transceivers, or virtually anything else to do with amateur radio operation, why not give VK 3LZ a call. Or you could simply drop in and see him at ham heaven ... err ... our head office that is.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call: (008) 338 915 Ph: (03) 529 7582 Fax: (03) 529 8485 A.C.N. 006 092 575

LL BROWN ADVERTISING 4506